

10 CENTS

CONSTRUCTION METHODS AND EQUIPMENT

January 1955



A McGRAW-HILL PUBLICATION

**Compressor plus light wagon drill
in one mobile self-contained unit!**

Gives you
Faster set-ups
Greater footage
Lower costs



Le Roi *TRACTAIR* with Mobildrill!

TALK about flexibility — you really get it from Le Roi Tractair with Mobildrill.

Mobildrill is a lightweight Le Roi CLEVELAND wagon-drill attachment mounted on Tractair, a combination 35-hp tractor and 105-cfm compressor. With it, you enjoy unusual mobility. One man can drill holes at any angle and any elevation up to 12 feet. Swinging boom permits drilling 4-6 holes of a pattern from one spot.

Tractair is really a handy man around a

quarry. Its mobility makes it ideal for secondary drilling and drilling toe, as well as for production drilling. You can use it to run hand-held drills and plug drills. And you can use it to run an air-operated sump pump for de-watering.

Have your Le Roi distributor show you Tractair at work, so you can get a first-hand picture of its money-saving versatility. See him soon. Write for job-data sheets and Le Roi Tractair bulletins.

LE ROI



Division of Westinghouse Air Brake Co.

Milwaukee 18, Wisconsin



PORTABLE AIR COMPRESSORS



TRACTAIR



STATIONARY AIR COMPRESSORS



ENGINES



AIR TOOLS



TRUCK MIXERS



FRONT-END LOADERS

B.F. Goodrich



All-Nylon All-Purpose tires help build Kansas county highways

TWENTY-EIGHT units are constantly kept busy building and maintaining the network of roads that crisscross



MASSIVE CLEATS in the All-Purpose tread are curved for greater gripping action. "Buttons" on alternate cleats defy slippage. And the center rib of this BFG tire widens as it wears, putting more and more rubber on the road for longer service.

Marion County, Kansas. Tons of fill dirt, rock and gravel must be hauled 48 hours a week over back roads, often over no roads at all.

The result could be a high rate of tire mortality if the county didn't use new B. F. Goodrich *all-nylon* All-Purpose tires. This is the tire that's built upside down to resist rock bruises far better than ordinary tires. Instead of having breakers just on top of the plies, the All-Purpose in addition has special breakers between the bottom plies to guard against bruises that start inside the tire.

All-Nylon Construction

B. F. Goodrich builds the All-Purpose with an *all-nylon* body. Nylon is stronger than ordinary cord materials, can withstand double the impact. This B. F. Goodrich tire outwears even its extra-thick tread—as much as 67%

deeper than that of a regular tire—and can still be recapped over and over!

Find out how much more mileage you'll get, how much money you'll save, with B. F. Goodrich *all-nylon* All-Purpose tires (also in rayon at lower prices). Your B. F. Goodrich retailer is listed under Tires in the Yellow Pages of your phone book. Or write *The B. F. Goodrich Co., Tire & Equipment Division, Akron 18, Ohio*.

Specify B. F. Goodrich tires when ordering new equipment





"Snake-Style" wall for Omaha Auditorium grounds. Peter Kiewit & Sons, Omaha, Gen. Con.

Symons Forms on Serpentine Retaining Wall

Symons Forms were used exclusively to form this serpentine retaining wall which is 20 feet high at the highest point and slopes to 8 feet high at the lowest point. These walls were constructed to facilitate parking on the grounds of Omaha, Nebraska's new city auditorium. Symons Forms were used for 30,000 square feet of forming on this job.

Symons Engineering Staff furnished complete form layouts and cost sheet for all the form work. This service was rendered at no charge to the contractor. In addition, Symons fieldmen gave regular on-the-job service.

Symons Engineering and Field Service is available to all contractors. On your next job get complete job layout and cost sheet—no obligation. Symons Forms, Shores and Column Clamps can be rented with purchase option. Paid rentals apply on purchase price.

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Please send information on items checked:		
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Name _____		
Firm _____		
Address _____		
City _____	Zone _____	State _____

CONSTRUCTION METHODS AND EQUIPMENT

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January 1955

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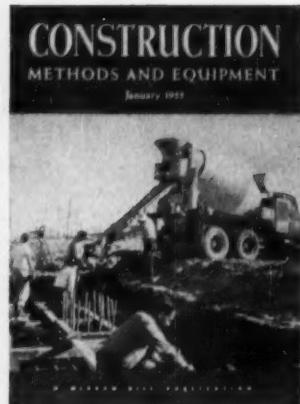
MEXICO CITY • SAO PAULO

TOKYO • MELBOURNE

CONSTRUCTION METHODS AND EQUIPMENT was founded in 1919, under the name of SUCCESSFUL METHODS, by the Manufacturers Publicity Bureau, Inc., of Chicago, representing a group of non-competing manufacturers of construction equipment. Charles H. Thomas, editor of the first few issues, was succeeded by William Jabine.

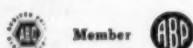
In 1929 the McGraw-Hill Publishing Company, Inc., of New York, purchased the publication, changing its name to SUCCESSFUL CONSTRUCTION METHODS in November of that year, to CONSTRUCTION METHODS in May 1927, to CONSTRUCTION METHODS AND EQUIPMENT in December 1936, and to CONSTRUCTION METHODS in October 1939. In July 1949, the name CONSTRUCTION METHODS AND EQUIPMENT was resumed. All rights to the foregoing titles are reserved by the publishers.

Robert K. Tomlin was appointed editor of CONSTRUCTION METHODS in January 1928, was succeeded by Waldo G. Bowman in January 1946, by Harold W. Richardson in February 1948, and by Henry T. Perez in June 1951.



On the Cover

Footings for yet another bridge on the spectacular system of freeways around Los Angeles are poured with little fuss or bother with transit-mixed concrete. The mixer, operated by Graham Brothers, is a 5½-yd Smith Premium, mounted on an International Model RF194 truck. Heavily reinforced footing, when completed, will help support a three-way bridge system.



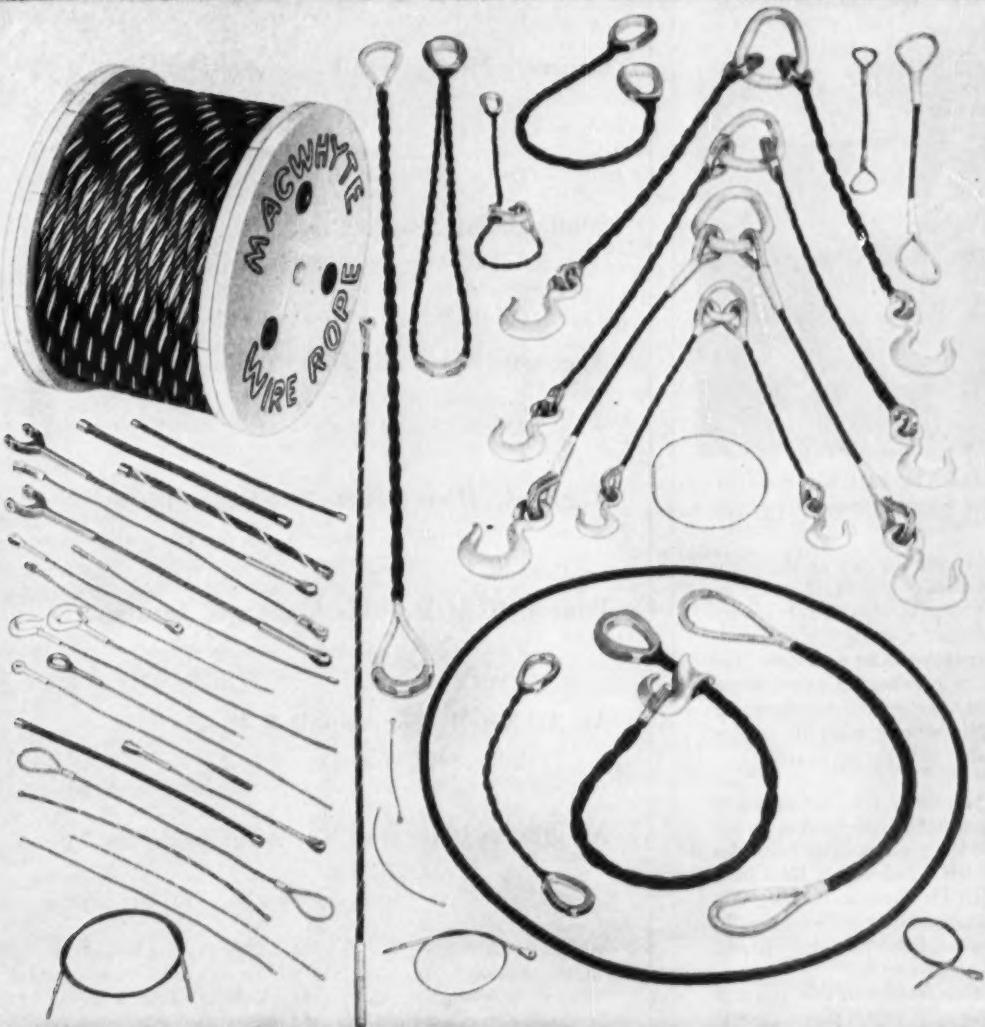
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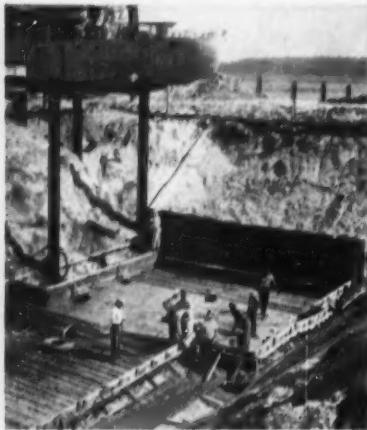
HOW TO HANDLE WET JOBS

#30 of a Series

MUNICIPAL POWER PLANT STRUCTURE

Jacksonville, Fla.

Contractor: George D. Auchter Co.



WELLPOINTS LOWER WATER
OVER 20 FT IN ONE LIFT

WHEN CONFRONTED with the problem of draining ground water to such a depth, most contractors assume that a costly 2-stage well-point system will be necessary. Today it is possible to avoid these costs, thanks to the development of improved new high-lift pumps (available only through Griffin).

- On the above job, for example, one such high-lift electric pump lowered the ground water from elevation 101 to elevation 80.7 in a single lift. Photo shows the bone-dry excavation, with men working 20 ft below adjacent St. John's River.

- Another feature of this job was the engineers' expert planning and placement of points, giving contractor trouble-free results in difficult soil—fine sand with layers of muck and hardpan.

GRiffin

WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.
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In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

Pay Dirt in This Issue

January, 1955

Huge Crawler Cranes Pour Strung-Out Dam 79

Two huge crawler cranes with 140-ft aluminum booms are doing a fast job of placing concrete in strung-out sections of Littleton Dam in New Hampshire. They travel to any part of the job, and reach up to 100 ft with a 4-yd bucket of concrete.

Concrete Mixing and Placing 102

Strength specifications have to be met by contractors. A concrete technician on the payroll can design and control mixes to meet specs, yet make a profit for his firm by using the most economical materials available.

Small Details Speed Big Job 66

Construction of Chicago's first major skyscraper in 20 years, the 41-story Prudential Building, shows how modern time- and labor-saving practices pay off.

Aggregate Plant Supplies Big Paving Job 74

A portable gravel plant teamed with three stationary log washers is turning out top quality aggregate for concrete runway paving at Plattsburgh Air Force Base in New York.

Big Rocks Divert Turbulent Snake River 70

Large shovels and tractors team up to stockpile heavy materials, then dump them quickly for river plug.

Poured Roof Deck Is Light and Insulated 77

Vermiculite concrete was mixed on ground, hauled on roof with carts, screeded for depth, finished with floats.

An All-New B Tournapull Is Ready 92

LeTourneau-Westinghouse brings out first new product after extensive field tests; announces new service policy.

Aluminum Falsework Truss Holds Bridge Span 129

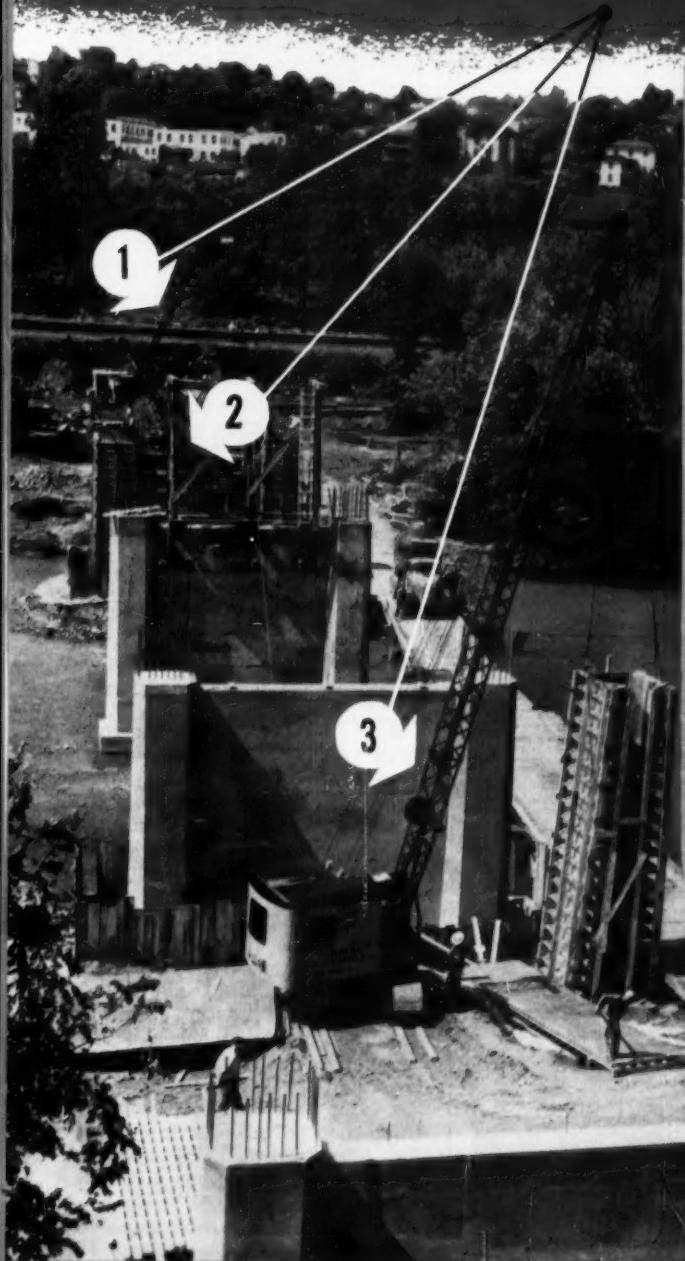
New design keeps the falsework light enough to be hoisted into place where floating-in was not practical.

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NEXT
MONTH

Cramped quarters at the New Jersey shaft of the Lincoln Tunnel provide tough muck-handling problems. Rock blasted out of the land section has to be hoisted out with a derrick, carried in cars across a 350-ft bridge, and dumped into a truck-loading hopper.

CRANE VERSATILITY for BRIDGE WORK



SEVENTEEN
NORTHWESTS
for
T. A. LOVING
Goldsboro, N.C.

Bridge work often calls for niceties in operation — accuracy in spotting, flexibility in booming. T. A. Loving of Goldsboro, N. C. is an old-time Northwest user. He has had 17 Northwests and here are three of them on one of his many contracts.

A good crane is good on every crane job! It's more than just a boom — or a feature — a clutch or a hoisting mechanism. It's a combination of a basic machine with its multiplicity of advantages — a combination of design, materials, balance, engineering—all the tangible and intangible qualities that result from years of experience.

Northwest brings you a choice of boom hoist equipment for any condition. Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and makes spotting the load easy (important with high booms). Northwest steering is smoother, assures easier maneuvering with the load when booming high. The "Feather-Touch" Clutch Control gives the "feel of the load" and makes operation smoother and easier without resorting to complicated mechanisms. When required, engine throttle control is available for operations requiring variable speed.

These are just the high spots for making the high lifts easier. Just a few of the reasons why one out of every three Northwests sold is a repeat order.

You can plan on a Northwest! Why not talk over placing an order. Get the full story.

NORTHWEST ENGINEERING COMPANY
1503 Field Bldg., 135 South La Salle St., Chicago 3, Illinois

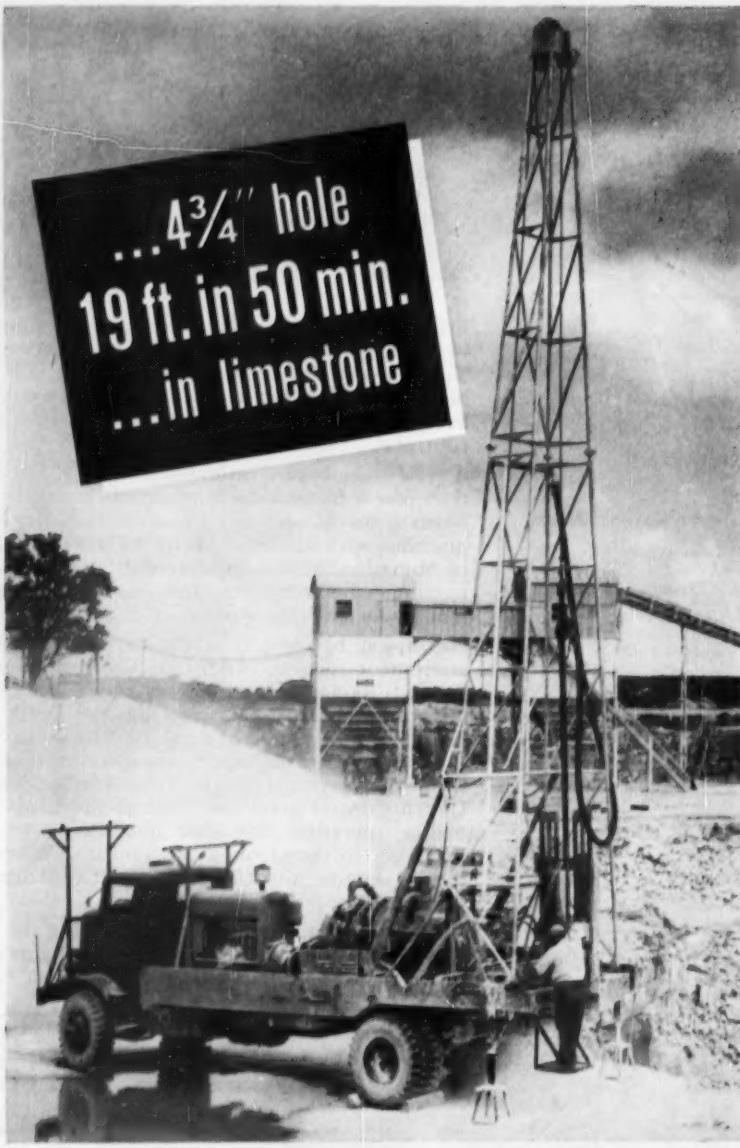


If you need rubber tired equipment, Northwest Truck Cranes bring you a combination of advantages in Crane and Carrier not found in other similar equipment. Get the details before you buy.

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS





WAUKESHA

Model 135-DKU — six cylinders,
4 1/4 x 5-in., 115 hp at 2000 rpm, max.

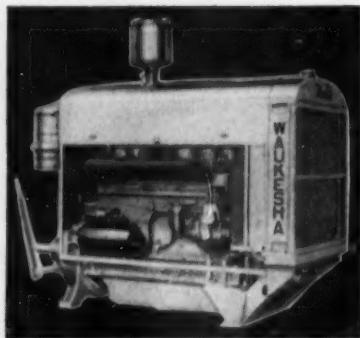
Diesel

● Quality Limestone Products, Inc., Sussex, Wis., drill a 4 3/4-inch hole to 19 ft. in 50 minutes, in limestone, with their Waukesha Diesel powered Joy Model 225 rotary blast hole drill with hydraulic feed. This high performance Diesel is an overhead valve, dry sleeve cylinder unit, with patented spherical combustion chamber. Clean burning and smooth running in all speed ranges. Send for Bulletin 1574.

WAUKESHA MOTOR COMPANY

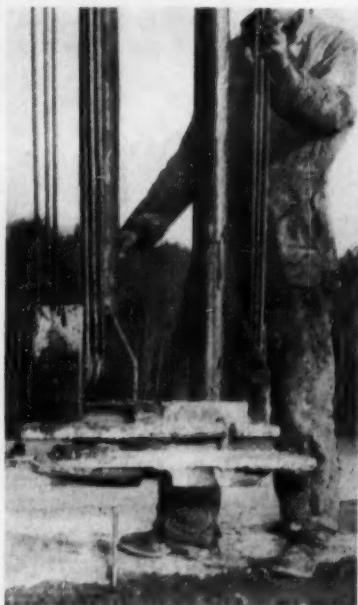
WAUKESHA, WISCONSIN

New York • Tulsa • Los Angeles



★ JOB TALK ★

...About Methods



DRIVER LEADS are lowered over steel peg on location for steel guard-post. Truck-mounted boom supports driving assembly.

Power Driver Sets Guard-Posts

Steel Posts for Ohio Turnpike guard rails at the eastern end were driven by a contractor-built post driver mounted on a Ford F-7 truck. The driver was built by Macek Brothers, of McKees Rocks, Pa. Its mechanism is powered by a 4-cyl Hercules engine and is controlled from the ground.

In operation, the truck is driven along the highway shoulder and stopped at points where steel marker pegs have been set into the ground to indicate where posts are to go. The steel guard-posts have been laid out in advance close at hand for the driving crew. The three-man crew works rapidly. As the truck-driver pulls up to a marker peg, the other two men guide the driver "leads," suspended from a boom on a turntable secured to the truck platform, over the exact location.

The leads are secured at the bottom by welded steel plate that also incorporates sheaves for the lifting cables. In the center of the bottom plate is placed a templet that fits over the locating pegs and is

(Continued on page 12)

HUBER — WARCO

**TWO FAMOUS NAMES IN ROAD MACHINERY
BECOME ONE!**

The Huber Manufacturing Company of Marion, Ohio, and the W. A. Riddell Corporation of Bucyrus, Ohio, are now combined in the new HUBER-WARCO COMPANY with headquarters in Marion.

Our combined lines include the following:

HUBER-WARCO MOTOR GRADERS: 4D-75, 4D-85 and 4D-115.

HUBER-WARCO MAINTAINER: With versatile attachments for service as a bulldozer, grader, broom, snow plow, berm leveler, lift-loader, side-dozer, road planer, mower or patch roller.

HUBER-WARCO TANDEM ROLLERS: 3-5, 5-8, 8-10, 8-12 and 10-14 ton.

HUBER-WARCO 3-WHEEL ROLLERS: 5, 6, 7, 8, 10, 12 and 14 ton. 8-10, 10-12 and 12-14 ton variable weight.

**HUBER
—
WARCO**

HUBER-WARCO COMPANY

Road Machinery

MARION, OHIO, U.S.A.

Road Rollers • Maintainers • Motor Graders

GET MORE* FROM YOUR ENGINES

***MORE POWER**—By lubricating with one of the *Texaco Ursa Oil* series, you can prevent harmful, power-stealing deposits, get *full power* from your diesel and heavy duty gasoline engines.

***MORE FUEL ECONOMY**—Fully detergent and dispersive *Texaco Ursa Oils* keep piston rings free for proper compression and combustion, assure full power with less fuel.

***MORE TIME ON THE JOB**—The superior lubricating ability of *Texaco Ursa Oils* minimizes wear, keeps engines on the job longer between overhauls, reduces maintenance costs.

The famous *Texaco Ursa Oil* series is a complete line of lubricating oils especially refined to make engines deliver *more power with less fuel over longer periods* between overhauls.

For your wire rope and open gears, use *Texaco Crater* or (for added application convenience) *Texaco Crater X Fluid*. You'll keep your wire rope strong longer, reduce

gear wear, bring down maintenance costs.

A Texaco Lubrication Engineer will gladly recommend the proper lubricants to help you get more from *all* your machinery and equipment. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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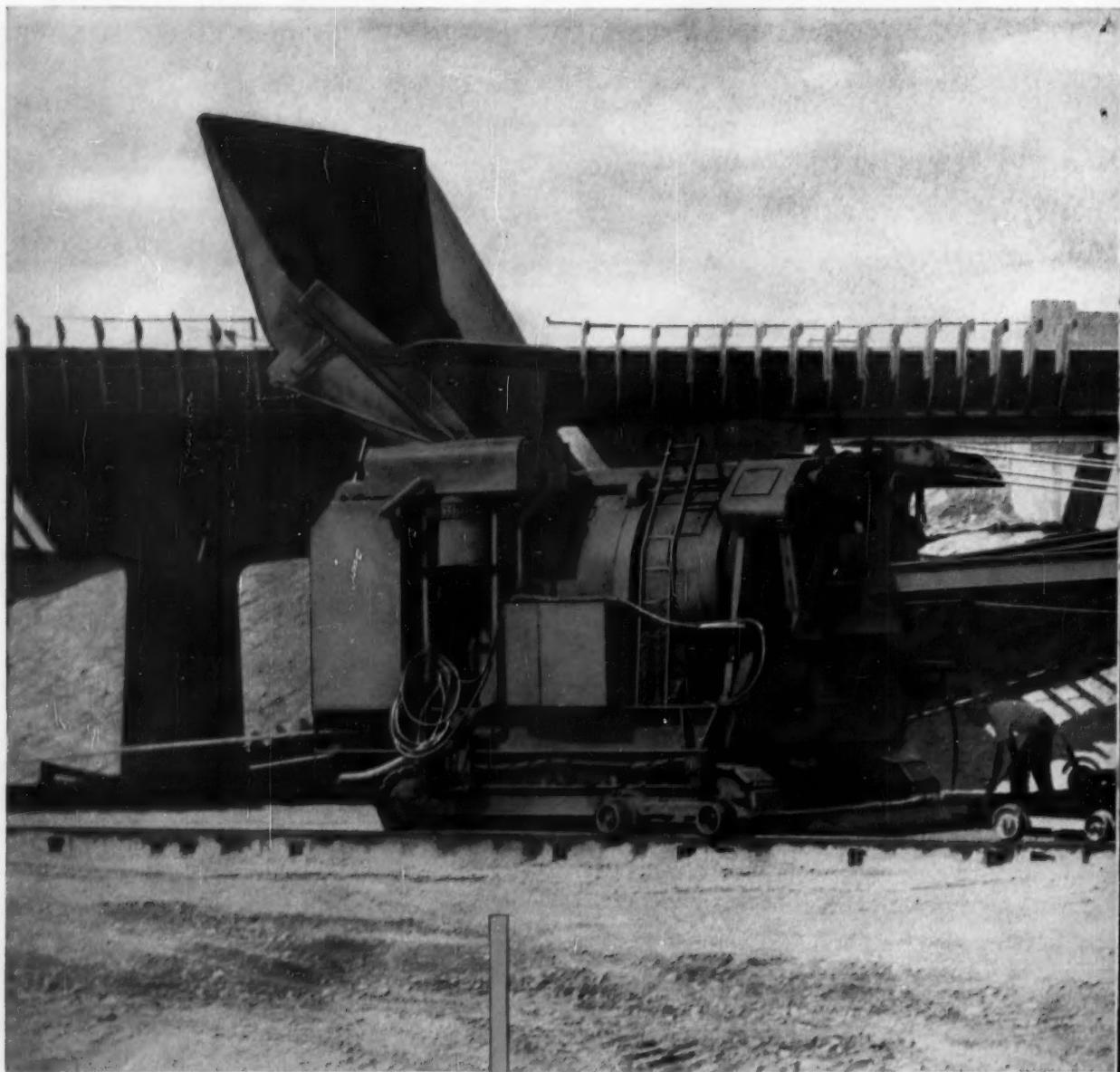
TEXACO



TEXACO SIMPLIFIED LUBRICATION PLAN
— Only six Texaco Lubricants are
needed to handle all major lubrica-
tion. Ask your Texaco Lubrication
Engineer for details.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT



Reserve production
capacity gains

**40 EXTRA
BATCHES
A DAY**

Koehring 34-E twinbatch® paver

hits a top output of 86.7 batches an hour, on 60-second mixing cycle. It maintains high average batching speed because — with twinbatch Autocycle mixing — there's plenty of reserve production capacity when you need it to offset normal job delays. This lets you pick up lost time which cannot be made up with limited-production single-drum pavers. For example:

A single-drum paver theoretically mixes up to 50 batches an hour, but usually averages only about 45 batches due to normal production delays. Under identical job conditions — and with the same set-up of auxiliary equipment — Koehring 34-E twinbatch easily averages 50 batches an hour, 8 hours a day. You gain 5 extra batches an hour.

New super-highway in the Mid-West is paved by a Koehring 34-E twinbatch. On this job the paving contractor also used a Koehring Longitudinal Finisher to keep pace with the high-production 34-E twinbatch.



over the single-drum paver — 40 extra batches a day. Yet, it requires only about 3 extra batches a day to offset the slight additional cost of a 34-E twinbatch paver. That leaves a net gain of 37 extra batches per day to help maintain schedules, complete more jobs per season, and earn more profits per job.

No expense for extra equipment

You get this extra paver production with no additional investment in auxiliary equipment. By maintaining 50 batches an hour, the Koehring 34-E twinbatch keeps your present batch plant, hauling and finishing equipment working at maximum efficiency. What's more, this increase over single-drum paver production requires no extra paver operating expense, service or maintenance. The 34-E

twinbatch is as simple as a single-drum machine. Basic units are the same, except for the double compartment drum — and, the Koehring 34-E is easier to operate because, with twinbatch Autocycle control, every mixing operation is automatic, accurate and fast.

You'll be miles ahead on your highway, airport and other big-production paving contracts with a Koehring 34-E twinbatch paver. Better see your Koehring distributor about it today, or write for bulletin. Also look into the mobile, rubber-tired 16-E twinbatch for smaller jobs.

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Subsidiaries: JOHNSON
PARSONS • KWIK-MIX



COMPANY

Milwaukee 16,
Wisconsin K538

**Two-wheeled Ingersoll-Rand
GYRO-FLO 210 compressor,
powering paving breakers on
U.S. No. 1 in New Jersey.**

**You'll Find Red Seal
Red Seal Trademark**

... EMBLEM OF DEPENDABILITY ...

INDUSTRIAL GASOLINE ENGINES

Model	Cyl.	Bore	Stroke	Disp.	Bore Engine H.P.
N56	4	2 1/2	3 1/2	56	14.2 @ 2200 RPM
N62	4	2 1/2	3 1/2	62	15 @ 2200 RPM
Y69	4	2 1/2	3 1/2	69	21.4 @ 2400 RPM
Y91	4	2 1/2	3 1/2	91	28.5 @ 2400 RPM
Y112	4	3 1/2	3 1/2	112	32 @ 2400 RPM
F124	4	3	4 1/2	124	36 @ 2400 RPM
F140	4	3 1/2	4 1/2	140	42 @ 2400 RPM
F162	4	3 1/2	4 1/2	162	49 @ 2400 RPM
F186	6	3	4 1/2	186	60.5 @ 2400 RPM
*E201	4	3 1/2	4 1/2	201	59 @ 2000 RPM
F209	6	3 1/2	4 1/2	209	68 @ 2400 RPM
F226	6	3 1/2	4 1/2	226	73 @ 2400 RPM
F244	6	3 1/2	4 1/2	244	79 @ 2400 RPM
M271	6	3 1/2	4 1/2	271	86.2 @ 2400 RPM
M290	6	3 1/2	4 1/2	290	92.2 @ 2400 RPM
M330	6	4	4 1/2	330	104.4 @ 2400 RPM
M363	6	4	4 1/2	363	109 @ 2000 RPM
B371	6	4 1/2	4 1/2	371	110 @ 2400 RPM
B427	6	4 1/2	4 1/2	427	127 @ 2400 RPM
G134	4	3 1/2	4 1/2	134	32.2 @ 2000 RPM
G157	4	3 1/2	4 1/2	157	37.7 @ 2000 RPM
H227	4	3 1/2	5 1/2	227	52 @ 1800 RPM
H243	4	3 1/2	5 1/2	243	56 @ 1800 RPM
*H260	4	3 1/2	5 1/2	260	60 @ 1800 RPM
T371	6	4 1/2	4 1/2	371	119 @ 2400 RPM
*J382	4	4 1/2	6	382	74.2 @ 1400 RPM
T427	6	4 1/2	4 1/2	427	140 @ 2400 RPM
U501	6	4 1/2	5 1/2	501	160 @ 2400 RPM
B513	6	4 1/2	5 1/2	513	164.3 @ 2400 RPM
R572	6	4 1/2	5 1/2	572	182.4 @ 2400 RPM
R602	6	4 1/2	5 1/2	602	191.7 @ 2400 RPM
S749	6	5 1/2	5 1/2	749	217 @ 2200 RPM
B820	6	5 1/2	5 1/2	820	237 @ 2200 RPM

INDUSTRIAL DIESEL ENGINES

Model	Cyl.	Bore	Stroke	Disp.	Bore Engine H.P.
GD157	4	3 1/2	4 1/2	157	39 @ 2000 RPM
*ED201	4	3 1/2	4 1/2	201	45.8 @ 2000 RPM
HC243	4	3 1/2	5 1/2	243	54.7 @ 2000 RPM
*HD260	4	3 1/2	5 1/2	260	59.3 @ 2000 RPM
*JD382	4	4 1/2	6	382	72.5 @ 1600 RPM
TD427	6	4 1/2	4 1/2	427	106.5 @ 2000 RPM
RD572	6	4 1/2	5 1/2	572	142.5 @ 2000 RPM
BR602	6	5 1/2	5 1/2	602	202 @ 1800 RPM

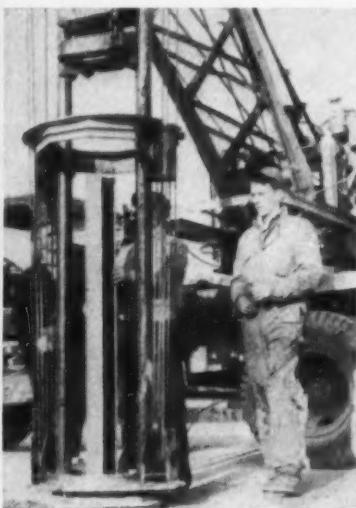
*Available for industrial applications only.

Continental Motors Corporation
MUSKEGON, MICHIGAN

JOB TALK . . . Continued from page 6

cut out to receive the steel H-posts. When the templet has centered the piledriver over the spot, the locating peg is removed and a post set into position.

Four or five strokes of the 1,100-lb weight of the driver on top of a 6x4-in. H-post 6 ft long usually are enough to drive it squarely into the ground to a depth of 4 1/2 ft for end posts and 3 1/2 ft for the middle ones. Posts are spaced 16 ft apart. The driver is air-powered, and the entire assembly is raised and lowered by cables.



SIX-FT POST is driven with four or five blows of an 1,100-lb weight. Cables lift and lower air-powered driver.

ON THE ENGINE OF LEADING MAKES OF:

Pumps . . . Compressors . . . Shovels
Cement Mixers . . . Graders
Earth Movers . . . Ditchers . . . Rollers
Well Drillers . . . Paving Machines
Winches . . . Hoists . . . Conveyors
Industrial Trucks . . . and other
Specialized Power Equipment

When choosing construction machinery, always remember that the leading makes of specialized equipment for every operation, from excavation on through final grading, offer the plus value of dependable Red Seal power. And Red Seal means plus value, because every model, no matter in what machine you find it, is engineered with the specific needs of that machine in mind. Red Seal industrial engines—14 to 237 horsepower—are backed by parts and service coast to coast. Look for the Red Seal Trademark on the engine of the equipment you choose.

• • •

6 EAST 45TH ST., NEW YORK 17, N.Y. • 611 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 3817 S. SANTA FE AVE., LOS ANGELES 58, CALIF. • 910 S. BOSTON ST., ROOM 1800, TULSA, OKLA. • 1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.

Precast Grade Beams Save Time

Two weeks construction time per building were saved recently by using precast grade beams instead of poured walls in the building of a 54x40-ft compressor station and a 54x30-ft auxiliary structure. The method was employed by the Chemical Plants Division of the Blaw-Knox Co., in beating a winter deadline for gas demands on the Manufacturers Light and Heat Co., Pittsburgh.

Construction progress was continuous. Six identical horizontal form panels were poured in three-day cycles, keeping pace with pier pouring. Form building and stripping were minimized. Excavation was kept to a minimum, work on ground level beats working in trenches, and stronger beams were produced with a simple 9-in. vertical

(Continued on page 16)



"Truly versatile motor oil...T5X!"



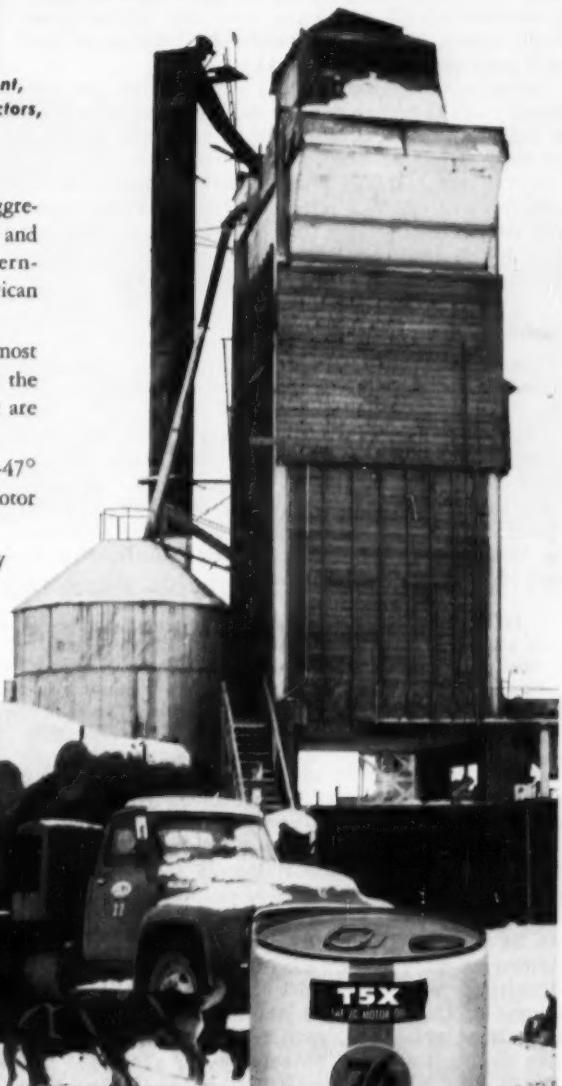
Floyd F. "Buck" Root, superintendent,
Lease & Leigland and M-B, Contractors,
Ladd A.F.B., Alaska.

"Our company supplies all the aggregate and concrete for both Ladd and Eielson Air Force Bases, northernmost bases on the North American Continent.

"This is our batch plant at Ladd A.F.B. which operates almost all year 'round. Like all our trucks and other equipment the Caterpillar and G.M. diesel generator sets which power it are all on Union T5X Motor Oil.

"Since we pour concrete at temperatures as low as -47° and as high as 90°+ you can see we need a truly versatile motor oil. We have it in T5X."

If you're operating your contracting equipment in widely varying temperatures it will pay you to do as "Buck" Root has been doing since 1949. Specify T5X. Immediately available from your nearby Union Oil representative.



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It's Your Business . . .

\$75-Billion 10-Year Highway Program: Will Bottlenecks Slow It Down?

New Program Double '54 Highway Work

The new highway program proposes a \$75-billion investment in new highway construction over the next ten years. This total consists of \$26 billion in additional federal-aid highways over and above close to \$50 billion already programmed by the states and local governments for the next ten years.

Actually, the highway needs of the nation are estimated at \$101 billion for the next ten years so that, as big as the new program is, it still falls short of the total estimated need.

As the new highway program now stands, it would mean an average \$7.5 billion per year for new highway construction over a ten-year period. That's more than double the record \$3.6 billion for all new highway construction put in place during 1954.

Contractors Can Handle It

Contractors think they can bite off this whopping increase in new work without suffering indigestion. This was brought out by G. C. Koss, vice-president of AGC (CM&E November '54, page 14) and it is confirmed by a special survey CM&E made in late November which shows:

Of the 950 heavy construction contractors (who signed up \$100,000 or more in '53 contracts) responding to this survey, 90% are interested in bidding on part of the new program.

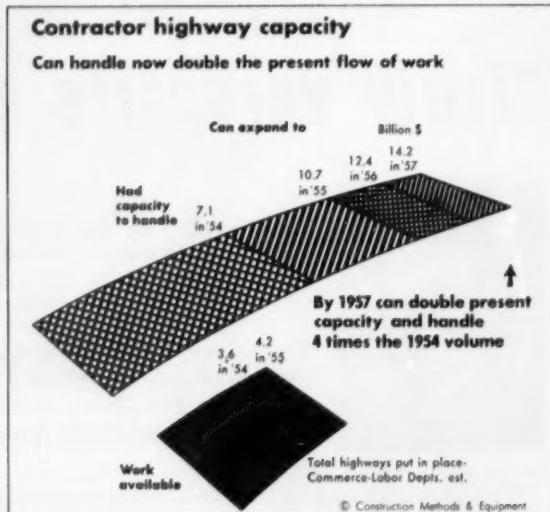
Of the 79% now doing highway construction, nearly all, 78%, had more highway contracting capacity than there was work available in '54. These contractors say, they could handle twice the amount of highway work available in '54 with their present capacity.

Add to this the 21% of those reporting who were not doing highway work but who would bid on part of the new program, and you get an idea of how big the reserve highway capacity really is. There is no doubt that contractors can handle a fast start in actual construction of the new proposed program.

Furthermore, this tremendous contractor capacity can be increased very fast. Contractors now doing highways report that by 1955 they could expand their capacity by 50%—enough to handle three times the volume of highway work available in '54. And by 1957, they could double their present capacity and take on four times the '54 volume—or about \$14 billion in new highway construction. That would be more than adequate to handle the new program.

Contractors See Engineer Shortage as Biggest Threat to Program

As contractors see it, there are three major shortages which could develop to slow down or hinder the



new highway program. These question marks are: experienced design engineers; cement; and contractors' supervisory personnel.

Of the contractors reporting, 49% think a shortage of experienced design engineers would slow down the program. They are more pessimistic than private engineering firms—of 380 consulting engineer and architectural engineering firms also included in the survey, 42% point to a possible shortage of experienced engineers.

Most concerned about a possible engineer shortage are the state highway departments. Of the 40 states (including D.C.) reporting to CM&E, 78% think there'll be a shortage of experienced design engineers. And 58% of the state departments believe a shortage of student engineers could develop. A big reason for the greater concern by the states is that public agencies in many cases pay engineers salaries that are too low to compete with private firms.

Of course, the states could use consulting engineer firms to handle part of the added design work. Of the states reporting, 73% say they will use consultants, but they'll farm out only about 25% of the added work.

The consultants could handle much more. According to those firms responding to the CM&E survey, they can do 50% more design and construction supervision than was available in '54. Furthermore, they say they can double their present design capacity by 1955 and triple it by 1956. That would enable them to handle four and one-half times the '54 volume of design work in 1956.

If the new program is to get off to a fast start and work is to keep rolling from the drawing boards to
(Continued on page 20)

23 pieces of CAT-built equipment on the job—every day!



**"At no time have we had a piece of Cat-built equipment down for a day.
It's on the go 95 per cent of the time."** Says Job Superintendent Sutton

To move 1,250,000 yards of borrow on a relocation job near Alton, Ill., R. B. Potashnick, Cape Girardeau, Mo., used 23 pieces of Cat* equipment. The equipment is on the job 10 hours a day, six days a week—without fail!

The D8 pictured—one of 11 D8s on the job—explains what makes big yellow equipment click. Equipped with a No. 8S Bulldozer and a sheepsfoot tamper, it is spreading and compacting fill.

There'll be no trouble with that 'dozer. Its moldboard is shaped to dig and roll a full load, making efficient use of the tractor's power. Carbon steel cutting edges are reversible. Lengthwise box-section reinforcements provide great strength for the blade.

And the D8 was built for hard-and-heavy use in any kind of terrain. Protected final drives and track rollers keep dust, mud and water out and lubricant in. Its sure-footed traction uses maximum engine power to do jobs quickly and inexpensively.

But most important, tractor and 'dozer are engineered to work together. Only Caterpillar manufactures both as matched equipment.

Follow the lead of construction leaders—standardize on Caterpillar equipment and watch costs drop, profits pyramid. See the difference for yourself. Call your Caterpillar Dealer today. Have him show you the new, more powerful D8. He's ready to demonstrate on your job!

Caterpillar Tractor Co., Peoria, Ill., U.S.A.



CATERPILLAR*

* Both Cat and Caterpillar are registered trademarks.—G

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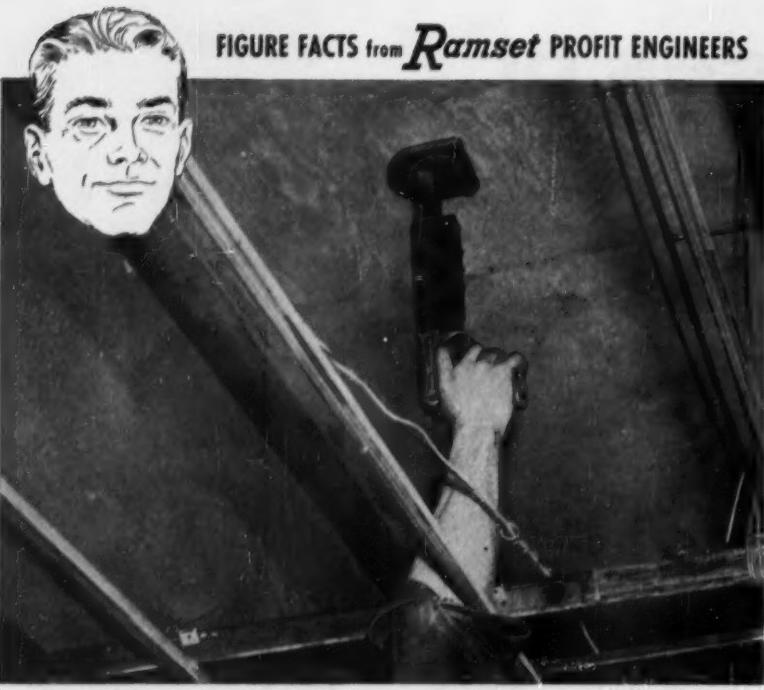


FIGURE FACTS from *Ramset* PROFIT ENGINEERS

PROFIT ENGINEERING HELPS JOHNS-MANVILLE SAVE 103 DAYS... ADDS \$2,400 PROFIT MARGIN

To install acoustical ceilings and walls for the Ohio Oil Company at Findlay, Ohio, required setting 11,000 eye pins in concrete. Johns-Manville used RAMSET SYSTEM, at the rate of 100 fastenings per hour, instead of 12 with old-fashioned methods. Result — costs were reduced by \$2,400 and the work completed far faster than originally anticipated.

Ramset features

INCREASE EASE AND EFFICIENCY

The compact, lightweight RAMSET JOBMASTER made light work of overhead fastening. One-hand, trigger operation was easy from scaffolds and ladders. Pin-point accuracy of Roto-Set Shield and Tru-Set Fasteners resulted in close-to-perfect performance with ample holding power.

FIGURE EVERY JOB WITH *Ramset*

TO INCREASE YOUR PROFIT MARGINS

General contractors find it profitable to see that subcontractors use RAMSET SYSTEM, to get the lowest possible estimates and to meet competitive bidding. Your nearby RAMSET dealer will give you on-your-job *Profit-Engineering* service for projects under way or in the planning stages. Write for booklet, *Modern Fastening Methods* and for detailed drawings and specifications for your anchoring work.



Ramset Fasteners, Inc.
RAMSET DIVISION • OLIN MATHIESON CHEMICAL CORPORATION
12103 BEREAL ROAD • CLEVELAND 11, OHIO

JOB TALK . . . Continued from page 12

cal pour by casting the 6-ft, 9-in. panels on their sides.

Only two different size forms were used to cast all grade beams. The beams set up in one day and were stripped on the third day. Lifting lugs were cast into them to make placing by crane an easy operation. After the cast panels were placed, reinforcement rods jutting from panel ends were welded to adjacent pier reinforcing steel. A simple pour of concrete inside forms set up on each side of the junction made the foundation wall continuous. The superstructure of the building consists of a steel frame with Transite covering.



PRECAST GRADE-BEAM is lowered into narrow trench for joining with reinforcing steel of column to be concreted later.

Stops Pile Slipping

From Sweden comes word that two port engineers of Gothenburg have devised a system for driving piles into rock shoal and to lessen side slipping on underwater slopes.

Inside the pile (which can be wood, concrete or other material) is a steel pipe that permits a rotating drill to operate through it. After a pile has been driven until it rests on the rock shoal, the drill is sent down and a hole bored into the shoal about 30 in. deep. Then the drill is pulled out of the pipe and a steel dowel, approximately 60 in. long, dropped to the bottom of the hole.

The steel pin keeps the bottom of the pile from slipping on slopes. Test piles have supported up to 150 metric tons without "sliding off." The new method is said to make it unnecessary to send down divers to bore "wells" for piles.

Here...



and Here...



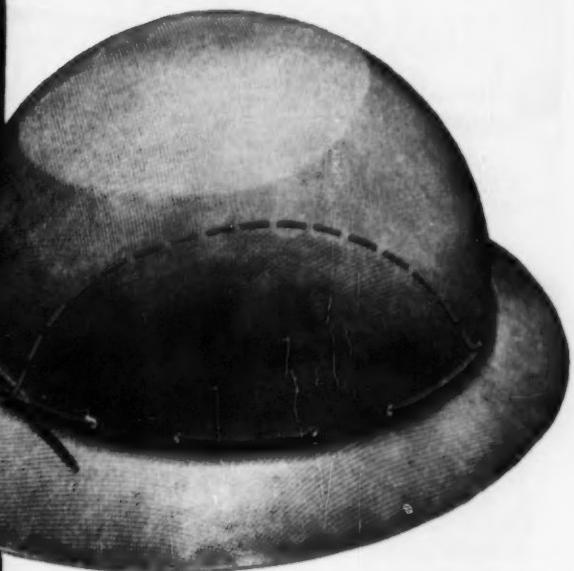
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In the new M.S.A. Skullgard, you get **EXTRA PROTECTION** in the *danger zone*—the front, top and back areas of a hat that working positions expose most often to impact.

The dotted line around the Skullgard above bounds the *danger zone* area, and shows you where new M.S.A. molding techniques, better materials, and improved production methods have *reinforced the protection without plussing the weight!*

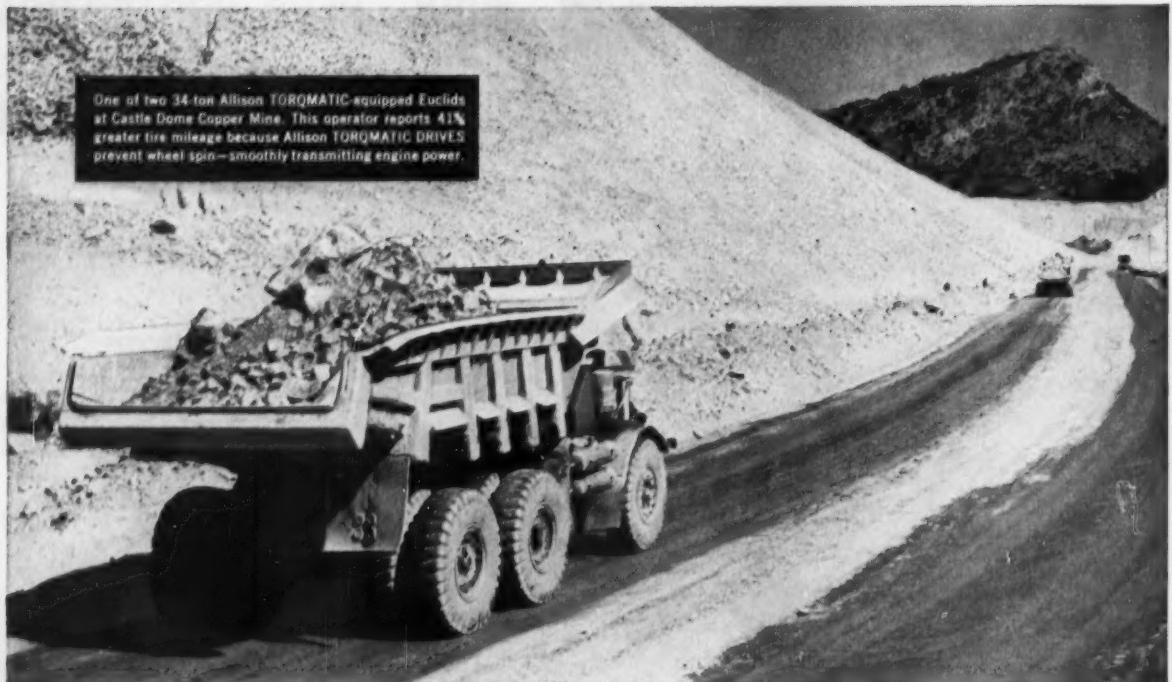
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*Call the M.S.A. Man on your every safety problem . . .
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"41% longer tire life"

Castle Dome Copper Company reports it gets 17,000 miles per tire on off-highway trucks equipped with Allison TORQOMATIC DRIVES compared to 12,000 miles per tire on mechanical-drive units. But increased tire life is only part of the story—the firm also reports the TORQOMATIC-equipped "Eucs" have better availability and production records.

This operator runs a fleet of 12 trucks—2 TORQOMATIC-equipped "Eucs" and 10 mechanical-drive units—hauling 390,000 tons of ore and overburden per month up 8% grades on mile-long runs. The "Eucs" average 25.3 trips per 8-hour shift, each hauling about 58,000 tons per month.

TORQOMATIC DRIVES smoothly transmit engine power—help prevent wheel spin that can quickly strip the tread from a tire. There's no clutch pedal to push and only three forward gearshifts—instead of the usual 7 or 10—handle all loads and grades. The matched converter-transmission team balances engine power and load demand, absorbs harmful drive-line

shocks, prevents damage to drive-line components, helps stop engine luggering.

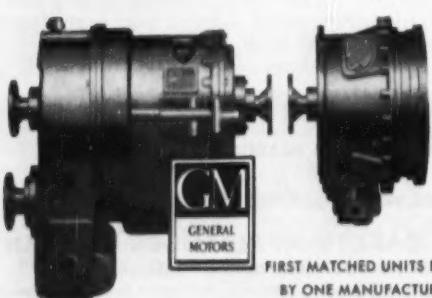
You, too, can cut your operating costs by specifying Allison TORQOMATIC DRIVES the next time you buy. Ask your equipment dealer, manufacturer or write:

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ALLISON TORQOMATIC DRIVES

Unbeatable Team for Maximum Operating Economy

- Cuts driver training costs
- Quick-Shifts at full throttle with fingertip hydraulic control
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- Only torque converter-transmission team designed to work as a unit and built by one manufacturer



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COMPACT, EFFICIENT HYDRAULIC DRIVES FOR CRANES • TRUCKS
TRACTORS • SCRAPERS • SHOVELS • DRILLING RIGS

WAYNE INTRODUCES

A COMPLETE NEW LINE OF
FULL 3/4-YARD
crane-excavators

"A CUSTOM-MADE MACHINE AT PRODUCTION-LINE COST"



■ EXCLUSIVE NEW DESIGN . . .

You get maximum economy with WAYNE'S exclusive design. Owners specify the equipment that exactly meets their requirements. The basic $\frac{3}{4}$ -yard machine is never loaded with unnecessary expensive features and accessories . . . it's custom-made at production-line cost.

■ BUILT-IN BONUSES . . .

Exceptionally high crawler ground clearance of 14", one lever controls all steering operations, full roomy cab, excellent visibility, positive crawler lock, major sub-assemblies independently removable . . . these are just a few of the many field-proven WAYNE features designed to give you more built-in hours of profitable operation.

■ WAYNE QUALITY . . .

The new WAYNE $\frac{3}{4}$ -yard crane-excavator joins a long line of dependable, field-proved products built by the American Steel Dredge Company. Almost 50 years' experience in designing and manufacturing earth-moving equipment stands behind the WAYNE reputation for highest quality at lowest cost.

■ OPTIONAL FEATURES . . .

For even greater performance, you can add these WAYNE-engineered accessories to your basic $\frac{3}{4}$ -yard machine . . . independent boom hoist, friction-type swing lock, extra-long crawlers, extra-wide treads, double-load rollers and power lowering on load line.

■ MONEY-MAKING OPERATIONS . . .

Check the outstanding performance of a WAYNE $\frac{3}{4}$ -yard machine on any job . . . shovel, trench hoe, dragline, clamshell or crane. Every smooth, precise movement of the rugged new WAYNE has one common purpose . . . continuous high work output.

■ MODELS AVAILABLE . . .

Crawler-mounted and rubber-mounted models in capacities up to 22 tons are available in the complete WAYNE line of $\frac{1}{2}$ and $\frac{3}{4}$ -yard crane-excavators.

WAYNE

A COMPLETE LINE OF
 $\frac{1}{2}$ and $\frac{3}{4}$ -YD. CRANE-EXCAVATORS

WAYNE SHOVEL and CRANE DIVISION
AMERICAN STEEL DREDGE CO. INC. • FORT WAYNE, IND.

IT'S YOUR BUSINESS . . .

Continued from page 14

contract, wide use of consultants to handle a big share of the added work will be a must.

Cement Capacity to Increase

Contractors put cement shortages as the No. 2 item on their list of major bottlenecks which could slow down the new highway program. Of those reporting, 39% have doubts about the availability of enough cement.

The largest percentages of contractors with such doubts are in the Middle West, 65%, Middle Atlantic, 60%, and in New England, 49%.

Less concern for cement is expressed by contractors in the South, West of Mississippi (and east of the Rockies) and Far West where the percentage of firms mentioning possible cement bottlenecks ranged from 20-28% of those reporting. The state highway departments agree with the contractors, except in the West of the Mississippi region where the states are much more pessimistic on the cement outlook than contractors.

However, in the last couple of months cement companies have announced a number of new cement plants to be built across the country. The industry, according to unofficial spokesmen, believes that a 20-25% expansion in cement capacity would take care of the added demand caused by the new highway program.

Examples of new cement expansions recently announced: Universal-Atlas to boost its Buffington, Ind., mill capacity by 40%, adding 3 million bbl to annual capacity; Lehigh Portland to spend \$15 million for a new mill at Union Bridge, Md.; Lone Star to spend \$14.2 million enlarging and modernizing plants at Nazareth, Pa., Greencastle, Ind., and Bonner Springs, Kan.; Ideal Cement plans \$5.5 million improvements to plants in Alabama, Louisiana and Texas; Medusa Portland adding 3 million bbl to its over-all annual capacity; General Portland adding 1 1/4 million bbl to its Houston, Tex., mill.

Contractor Supervisory Personnel

The third most important and crucial area where contractors see possible shortages holding up the new highway program is in qualified supervisory personnel. This has always been a key problem faced by the individual contractor.

(Continued on page 26)



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Lynchburg—Marion S. Branch

Norfolk—The Henry Walk Company

Richmond—Smith-Courtney Company

Richmond—Tidewater Supply Company

Roanoke—J. W. Burress

Roanoke—Tidewater Supply Company

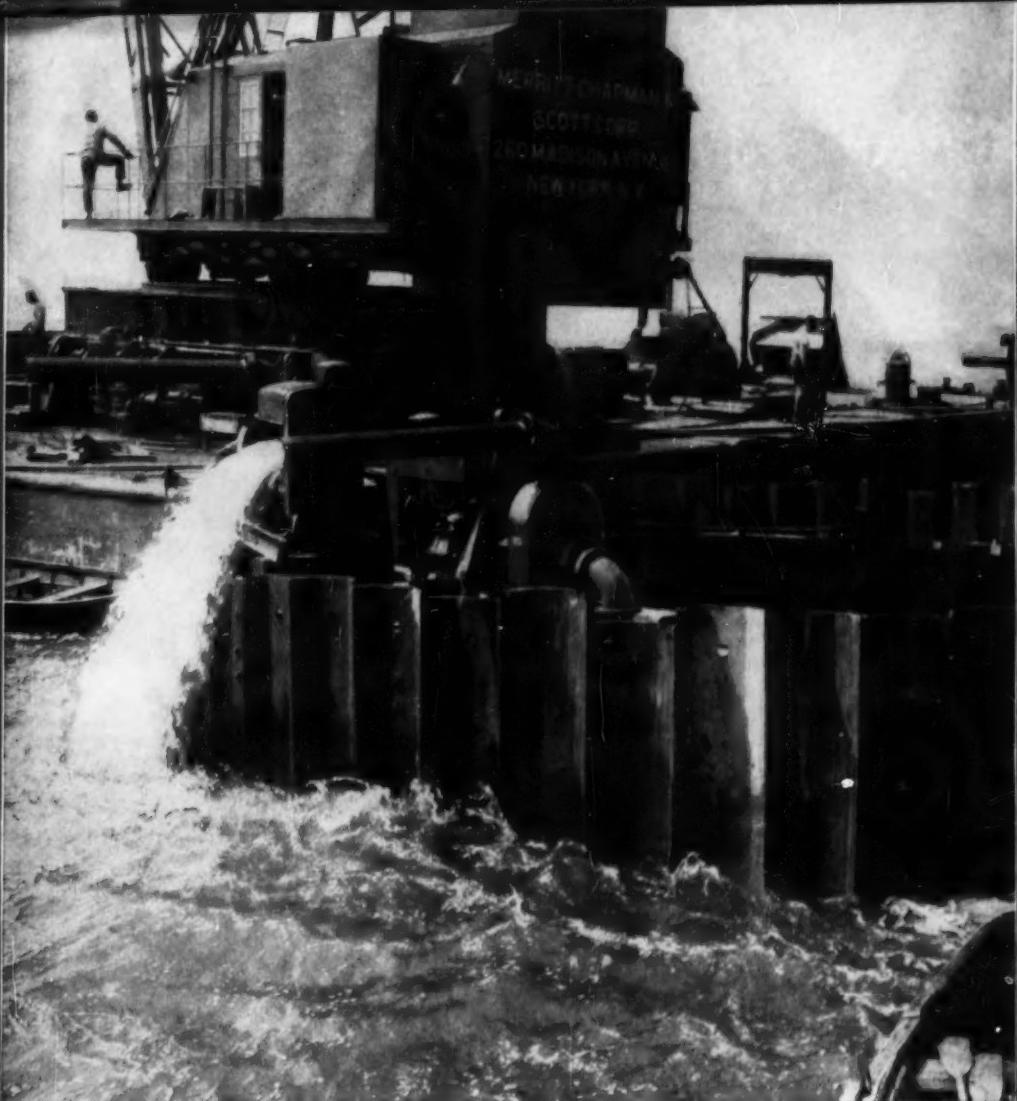
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Milwaukee—Aring Equipment Company, Inc.



PIERS FOR THE THREE MILE BRIDGE over the Hudson River on the New York State Thruway between Nyack and Tarrytown created no problem for Merritt-Chapman & Scott Corporation of New York City. Of a total of 23 piers, 15 were built with cofferdams, two for each pier. Dependable, 8" AGC rated Marlow Self-Priming Centrifugal Contractor's Pumps were used on the job to dewater the cofferdams quickly and handle seepage water efficiently.

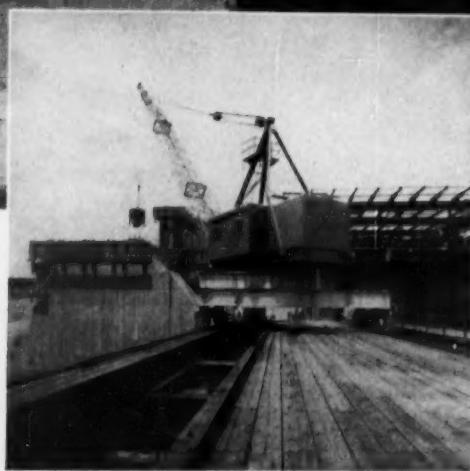
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Clyde Whirley does hook work at Sandy Hook



WORKHORSE ON THE HOUSATONIC

is this Clyde Whirley at work on the Connecticut Light and Power Company's dam at Sandy Hook.

Clyde now offers a new line of Whirleys that offer the ultimate in safety, efficiency and ease of handling. Starting with the hoist, you'll find a unit specially designed for Whirley service. Drums are narrow to assure a better cable spooling. This permits the entire hoist to be narrowed so that, except on the largest size, the machinery cab can be shipped intact with the machinery in place . . . a feature that substantially reduces erection time and costs.

Ball and roller bearings on all shafts and drums minimize maintenance and reduce friction, thus effecting additional economy in power savings.

Air operated band friction clutches, brakes and boom drum pawl give smooth, positive and safe load control at all times, with no effort on the part of the operator.

The rail circle is supported at every point by main

side beams and diagonal beams of the rigid turntable. Wide flange, uncut beams with box-section cross girts and diagonal bracing form the rotating frame which supports the A-frames, boom and machinery cab.

The rotating frame turns on equalized wheel carriages which permit definite determination of actual wheel loads. The tapered wheels allow true rolling on the rail circle with no slippage.

It will pay you to carefully consider these and all other cost-cutting, profit-boosting 'Quality-Plus' features of the new line of Clyde Whirleys. Without obligation you are invited to consult our engineering department relative to your particular needs.

If you haven't received a copy of the new Whirley Bulletin N-12, let us know. We'll be happy to send one to you.

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From just one pint of used motor oil, Pure Oil technicians can tell you what may go wrong with an engine, what could cause it and what to do about it *now* to prevent a costly repair job.

This valuable service . . . called Pure-sure Used Oil Analysis . . . is offered *free* to users of Pure Oil products. We want to give you a *free* Pure-sure Used Oil Analysis for one of your engines to show you how valuable this service can be.

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170 cu. yds. per hour on 1600-ft. cycle

Tulsa contractor averages 170 cu. yds. hourly with TD-24s and B-250 INTERNATIONAL scrapers on 1600-ft. cycle while helping cut 24 per cent off length of Oklahoma highway

The D. W. Falls Construction Company of Tulsa holds the prime grading contract for 7.6 miles of Oklahoma State Route No. 20 between Hominy and Ralston. They were able to make cost-cutting short cuts in earthmoving operations on the project that cut travel distance 24 per cent by using three INTERNATIONAL TD-24 drawn B-250 scrapers moving 27 cubic yard-heaped loads, and push-loaded by a TD-24 crawler.

Take it from Supt. Bob Derington:

"It's really surprising how much dirt these big scrapers will move per day. Under fairly good working conditions, each unit gives me a day-after-day average of 170 cu. yds. of dirt an hour while working a 1,600-foot cycle."

You can get pay-off performance by hitching INTERNATIONAL scrapers to the TD-24—still the Champ of the crawlers with 161 drawbar horsepower. That's the kind of hook-up that loads, hauls and spreads faster than any other combination . . . day after day . . . year after year. Just call your INTERNATIONAL Industrial Power Distributor for demonstration proof. He'll bring the combination you specify anywhere, anytime so that you can see why INTERNATIONALS make every load a payload.

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INDUSTRIAL POWER

MAKES EVERY LOAD A PAYLOAD



SMOOTH-WORKING TEAM. Four INTERNATIONAL TD-24 crawlers and three B-250 scrapers delivered a total of 510 cu. yds. hourly on the 1,600-foot cycle for D. W. Falls.

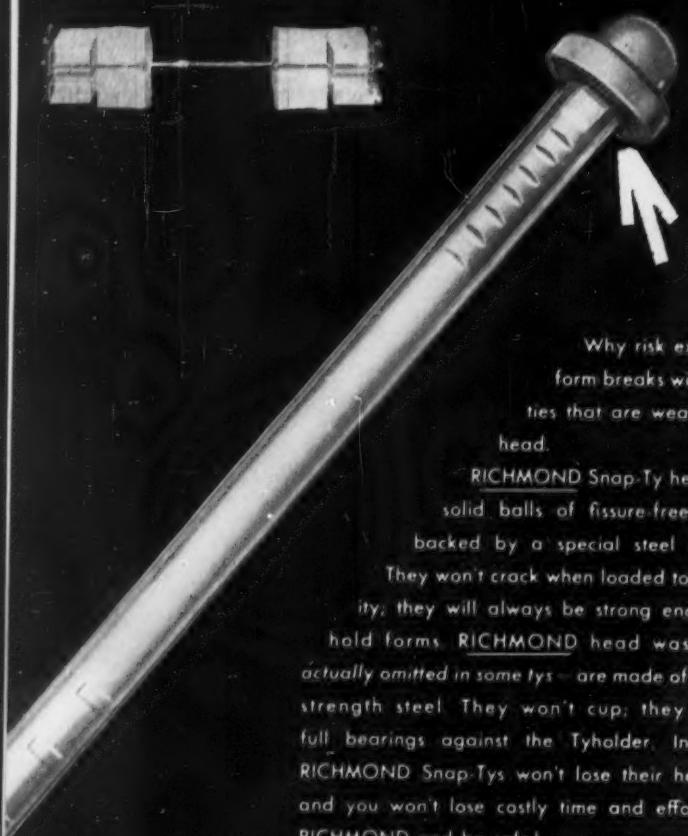


TD-24 POWER FRONT AND BACK PUTS these kinds of 27 cu. yd.-heaped loads in the INTERNATIONAL B-250 scraper in a matter of seconds for D. W. Falls on the company's 7.6-mile project requiring 250,000 cu. yds. of excavation.



EASY, FAST HAULING of heaped loads is assured with this equipment combination. The B-250 scraper requires minimum drawbar pull and has a low center of gravity that gives outstanding stability on side slopes like this.

Richmond Snap-Tys never lose their heads!



Why risk expensive form breaks with form-ties that are weak in the head.

RICHMOND Snap-Ty heads are solid balls of fissure-free metal, backed by a special steel washer. They won't crack when loaded to capacity; they will always be strong enough to hold forms. RICHMOND head washers — actually omitted in some tyes — are made of special strength steel. They won't cup; they insure full bearings against the Tyholder. In short, RICHMOND Snap-Tys won't lose their heads... and you won't lose costly time and effort. Use RICHMOND and be safe!

Make it Richmond All the Way
Engineered Tying Devices • Anchorages and
Accessories for Concrete Construction.

For our complete catalog,
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Construction File 2IRI;
Architectural File 2IRI.

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IT'S YOUR BUSINESS . . .

Continued from page 20

as he expands, and the solution will depend upon how well his training program is organized.

During the tight competition of the last two years, contractors have done their utmost to hold their organizations together, sometimes bidding jobs at or even below cost to keep their equipment and personnel working. This effort will pay off when the new program begins to move out of the design stage for construction bids.

No Equipment Shortage Seen

Most contractors are well stocked with equipment these days, following record purchases of new machinery in 1952 and '53. So it's not surprising to find that few are concerned over a possible shortage of equipment holding back the program. Furthermore, they know that the equipment industry can move fast in supplying them with new machines, as needed.

Besides cement, contractors feel that structural steel may be the next most serious materials bottleneck, although only 12% of the firms reported such a shortage would be likely to occur. However, 43% of the state highway departments reporting think a steel shortage would develop to hinder the new program.

Aggregates could become scarce, according to 9% of the contractors and 13% of the states reporting. The Middle Atlantic and Middle West are the regions where this shortage is most expected.

As for asphalt, very few contractors or state highway departments see any prospects of a shortage developing.

SOME BIG CONTRACT AWARDS OF THE MONTH

George A. Fuller Co., 597 Madison Ave., New York 22. Thirty-story air-conditioned office building, 425 Park Ave., New York City, for a Syndicate, c/o George J. Engler, 307 Seventh Ave., New York 16, N.Y. \$15,000,000.

Lycoming Construction Co., 127 Susquehanna St., Williamsport 19, Pa. Constructing 6.62 mi Northeastern extension in Bear Creek and Dennison Townships, Luzerne Co., Pennsylvania, for Pennsylvania Turnpike Comm., 11 North 4th St., Harrisburg, Pa. \$3,068,363.

(More Big Jobs on page 176)

Greatest speed, power and work range of any full 1-yd rig!



It's the LS-98...another NEW Link-Belt Speeder

IN the full 1-yard class—they don't come any faster or more powerful than the new LS-98 Link-Belt Speeder! Since first introduced in May, coast-to-coast records prove you get more productive capacity, no matter what the job!

Speed-o-Matic power hydraulic controls make machine movements instantaneous, smooth, precise. Effortless operation helps increase output 25% and more.

You get more cycles too, because LS-98 has more "live" weight and structural strength to utilize extra useable hp. Combine this with exceptional maneuverability plus practical transportability—no wonder LS-98 is acclaimed today's greatest full 1-yard shovel-crane investment!

ATTENTION ALL SHOVEL-CRANE BUYERS:

Your Link-Belt Speeder Distributor is currently introducing a great deal of new equipment to help you make more money. So, before you buy a shovel-crane of any capacity for any application—be sure you check with him. You'll be glad you did.

LINK-BELT SPEEDER CORPORATION, Cedar Rapids, Iowa

A few of the many LS-98 features

★ **Speed-o-Matic** controls put LS-98's extra hp at operator's fingertips. Smooth dig-swing-dump action means more cycles per day.

★ **Foolproof power steering.** Every travel and operating action is controlled from operator's position, even setting the digging brakes.

★ **Power load lowering clutches.** Available for either or both main drums. An exclusive feature.

★ **Interchangeable, shear-type clutches** are self-adjusting, internal expanding. Shells are high-friction alloy cast iron. All clutches interchangeable.

★ **Massive, dual, conical hook rollers**, riding on roller bearings in machined roller path, eliminate center pin pull and increase roller path life.

★ **Gears enclosed, running in oil.** All horizontal deck gears and swing-travel bevel gears enclosed and run in oil.

13-687

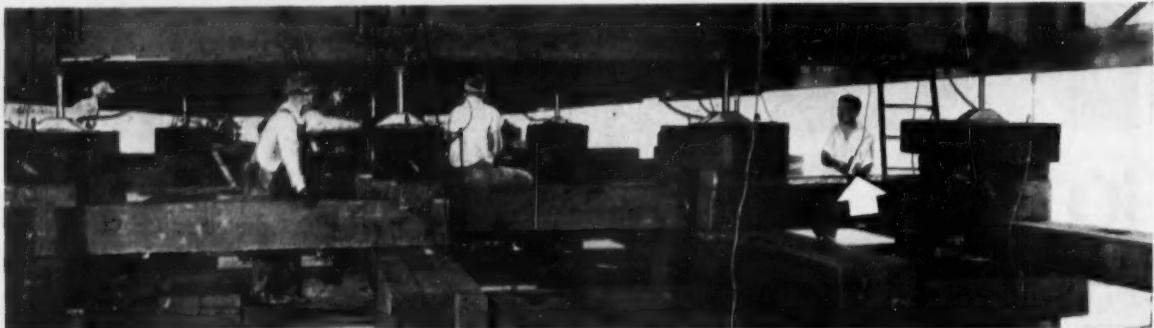
LINK-BELT SPEEDER

BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

PROBLEM: RAISE A BRIDGE 20 FEET ...



SOLUTION: RODGERS HYDRAULIC JACKING UNITS !



It isn't often that you have to raise a bridge, but when you do, you'll discover why versatile, powerful Rodgers Hydraulic Jacking Cylinders and Pumps were selected by the Engineering Department, City of Minneapolis, as the safest, quickest and lowest cost method for raising two bridges spanning the Mississippi River. Both structures were raised twenty feet as part of the development of the upper river harbor.

One bridge, consisting of four 200 foot spans and the other, consisting of six 156 foot spans, were raised by lifting one span at a time. To do the job, twenty 30 ton jacking cylinders were placed on cribbing—10 at each end of the span to be raised. An electrically powered hydraulic pump operated the group of ten cylinders at each end. A 13 inch ram travel on the jacks produced completed lifts of an average of 5 feet per 8 hour day, including all cribbing and staying assemblies.

Remote, push button controls permitted the pump operator to go under the bridge where he could watch each lift first hand. The individual pumping source at each end assured absolutely equal lifting force at every jacking point.

Rodgers Hydraulic Jacking Units with hand or powered pumps can be used wherever needed to PUSH, LIFT or PULL. Available in capacities from 50 to 600 tons with standard ram travels from 6 to 48 inches. Ram travels to 72 inches available on special order. Rodgers engineering department will be glad to assist you in the selection of the exact jacking units required for your particular lifting, pulling or pushing job—large or small.

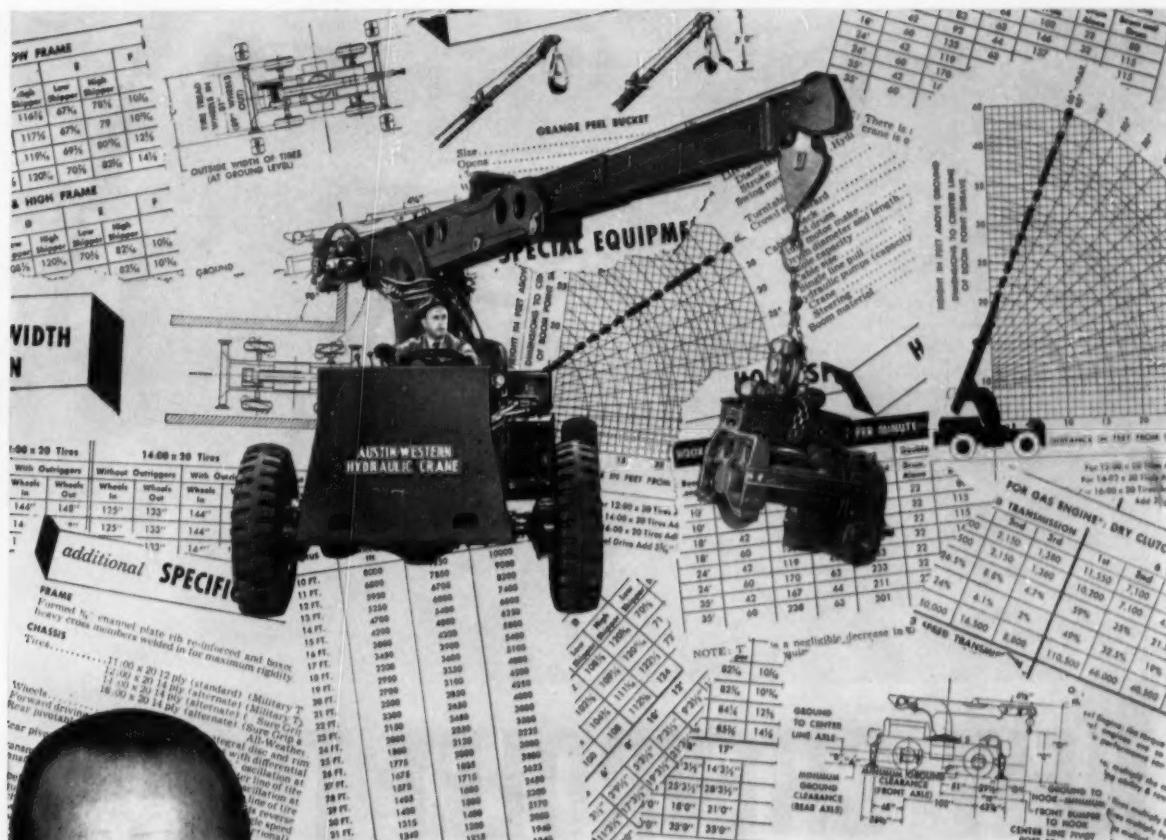
FREE—Complete report on the jacking phase of the bridge raising job described above—written for you by the engineer-in-charge! Ask for Bulletin 327. You'll also want Rodgers free Bulletin 317A. It contains a complete description of Rodgers Hydraulic jacking units, quick couplers, valves and hoses, and a description of hydraulic equipment used in the construction of tunnel shields.



Rodgers Hydraulic Inc.

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With its telescopic boom, 360° rotation and extra fast boom-and-cable action, the Austin-Western Hydraulic Crane is setting new records . . . indoors and outdoors . . . in a wide variety of industries; records made possible by the performance characteristics described in Data Book No. 2253, which "blueprints" such things as: working ranges . . . boom extensions . . . minimum aisle widths . . . tractive effort . . . towing capacity . . . special attachments and many other features. Write for your copy today.

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NEW CHEVROLET TRUCKS

**engineered and designed
with your profit in mind!**

Everything about these new Chevrolet trucks spells *profit!* Their low cost, their stamina and dependability, even their traditionally higher resale value!

COST LESS TO BEGIN WITH

That's right, Chevrolet brings you America's lowest-priced line of trucks—so you save right from the start. The beauty of it is, you go right on saving! With the high compression ratio of Chevrolet's three great engines, you register more miles on the job for each tankful of gas. You can count on fast starts; easy pulling up steep grades. You stay on schedule and keep the profits coming in *on time!*

COST LESS TO MAINTAIN

That's because of the rugged strength and stamina engineered into every new Chevrolet truck. They stay on the job longer (actual owner reports prove it!), cutting your maintenance costs right to the bone. Look over the many advance-design features in the next column and you'll begin to see why.

Your best bet is to talk trucks with your Chevrolet dealer. He'll tell you all you want to know about these Chevrolet profit-makers! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

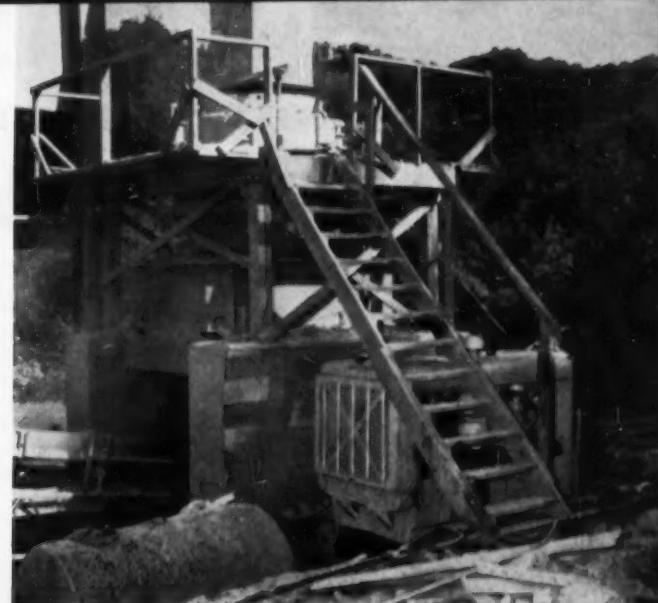
THREE GREAT ENGINES—The "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **TRUCK HYDRA-MATIC TRANSMISSION***—offered on $\frac{1}{2}$ -, $\frac{3}{4}$ - and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—positive-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **RIDE CONTROL SEAT***—eliminates back-rubbing. **LARGE UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give trip-saving load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance.

*Optional at extra cost. Ride Control Seat is available on all cabs of $\frac{1}{2}$ -, and 2-ton models, standard cabs only in other models. Jobmaster 261" engine available on 2-ton models, truck Hydra-Matic transmission on $\frac{1}{2}$ -, $\frac{3}{4}$ - and 1-ton models.



On the West Virginia Turnpike

HOW CAT* ENGINES HELPED PRODUCE 3,000,000 TONS OF CRUSHED ROCK —IN A HURRY



Lambert Brothers crushing plant uses a D13000 to help produce 1,000,000 tons quickly.



Two Cat Electric Sets supply all the power for Central Materials crushing plant.

BECAUSE the 88-mile West Virginia Turnpike was to be paved in four months, 3,000,000 tons of rock required for base material had to be crushed and stock-piled starting in mid-winter. At the seven crushing plants, Caterpillar yellow was a predominant color.

Reported L. Freeman, plant foreman, Central Materials Corp., Canandaigua, N. Y.: "These Caterpillar Diesels are the answer to the prayer and wishes of a rock-crushing company. They furnish all our electric power. We needed an absolutely dependable power supply and the Cat Engines gave it to us. They couldn't be better."

Central Materials supplied 500,000 tons from two plants. A D386 and a D364 Electric Set powered a Cedarapids crusher designed to produce 250 tons an hour. A D8 with 'dozer worked at the quarry and a No. 12 Motor Grader leveled at the stockpile.

Reported Charles Ogle, superintendent of Lambert Brothers, Inc., Knoxville, Tenn.: "Our Caterpillar Diesel Engines stand up under hard conditions. They require less attention than other diesels. The abrasive dust from the crushers does not get into their internal parts to cause expensive wear and down time."

Lambert Brothers plant produced 1,000,000 tons. A Caterpillar D8800 Electric Set powered belts and screens.

Two Telesmith 30 x 42 jaw crushers were each powered by a D13000 Engine. A D6 worked the quarry.

Here then are two good reasons to have modern, heavy-duty Cat Diesels on your side when a big job has to be done and done fast. One contractor liked their dependability, the other the way their seals and filters eliminated premature wear.

Next time you order new equipment, get the best—specify Caterpillar Engines. Leading manufacturers of crushers, excavators, compressors and other construction machinery can furnish Cat Engines as part of their equipment. And when it's time to repower, your Caterpillar Dealer can show you 12 sizes of engines and electric sets up to 500 HP and 315 KW.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

MODERN
HEAVY-DUTY POWER

Eaton 2-speed Axles have

4

Planetary Gears

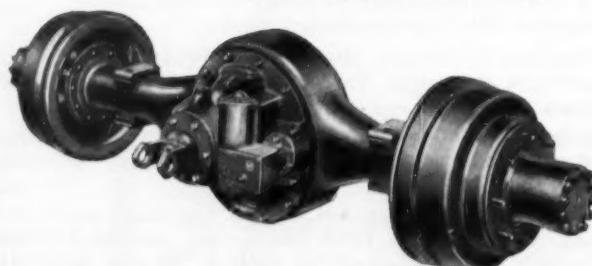


to share the load

- ★ Gear-tooth loads are distributed over several rugged gear teeth.
- ★ The husky planetary pinions turn only in the low speed range; in high speed they are locked out.
- ★ Stress and wear are reduced to a minimum.
- ★ Gear speeds are slower.
- ★ Quiet operation and easy clash-free shifting are assured at all truck speeds.
- ★ Long life and trouble-free operation are proven through actual performance records.
- ★ Simple common-sense design assures easy, low-cost maintenance.

Ask your truck dealer
for complete information.

More than Two Million
Eaton Axles in Trucks Today!



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AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO



PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater Defroster Units • Snap Rings • Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

New Entrant in Crawler Tractor Field

When the Management of The Eimco Corporation, one of the West's oldest and largest manufacturers of heavy mining and industrial machinery, decided to go into the tractor field, they did so with their eyes wide open. They knew they would have to go into tough competition with the big three. They knew they would have to overcome buyers' purchasing habits, and the strong entrenchment of existing tractor manufacturers.

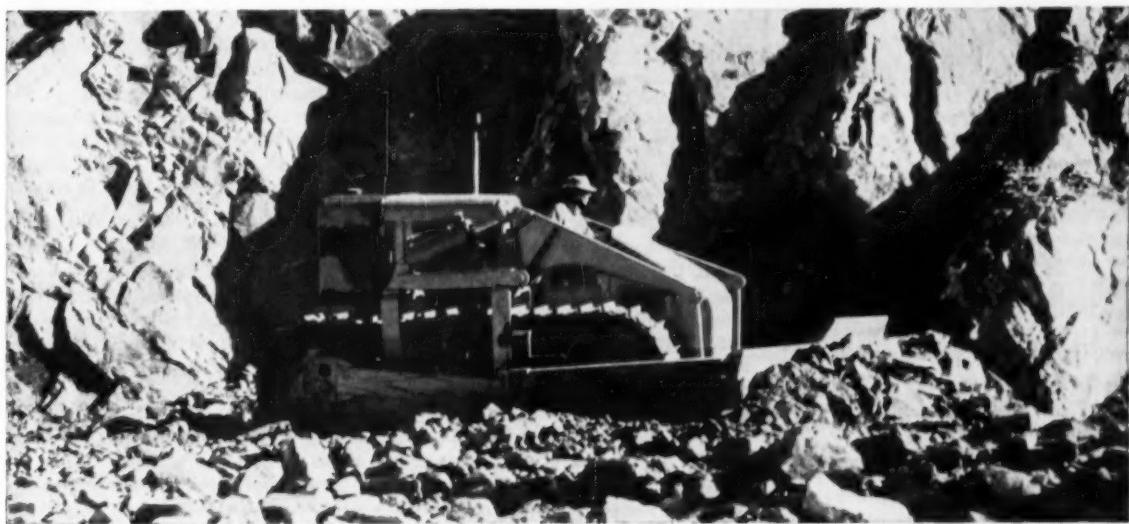
A very careful and exhaustive study was made of tractors, their weaknesses, their design and service

short-comings; all in light of what it is the user of tractors the world over wanted to have in his tractor.

After this was done, Eimco was convinced that there was a place for a better tractor. Eimco believes that the contractor, the quarry operator, the miner who uses the tractor as an aid in making his living, in reducing his costs, in making possible a profit for the work that he does, would listen with an open mind to a responsible, dependable manufacturer able to offer that kind of a really better machine.

Eimco has put over five million dollars into the perfection of this tractor. Eimco believes that men who buy tractors and use them would want to have spelled out in this first announcement all the descriptive facts which tell why the Eimco is really a better tractor. Important advances in design and construction give to you as the tractor user more for your money initially, easier operation, greater workability and lower maintenance costs.

With this in mind, the facts are proudly presented herewith.



Eimco's 27,000 pound tractor (34,000 pounds with bulldozer) with 120 HP Diesel engine, torque converter and ability to turn in its own length by driving one track forward and the other reverse and "The easiest tractor on the market to operate—bar none."

The Eimco Tractor is an entirely new prime mover with many important features in addition to those listed above, such as: Oscillating tracks, even with attachments; full visibility for the operator; finger-tip control that is as easy to operate as your 1955 automobile — without clutches to engage or gears to shift, plus instant reversal; alloy steel construction and sealed anti-friction bearings.



Eimco realizes that there are three or four well established manufacturers producing competitive crawler tractors, but believes that there are many people interested in a superior product that will give them lower costs, more production, and lower maintenance.

This Eimco Tractor, built for the heaviest most rugged service, but selling at a price of \$15,950, will absolutely have to be investigated by everyone before buying a tractor in its work class.

In the pages that follow, details on the many superior features of this new tractor tell you why this is a better tractor, why it will do more work for you and how you can benefit from its use.

Everything that years of experience in heavy machinery have shown to be better is built into this tractor, from alloy-steel castings made from electric furnace steel to the use of the finest and latest ma-

chine tools for high production and extreme accuracy in machined parts.

Eimco was not handicapped by a shop full of antiquated ideas that could not be discarded—they started fresh with today's best available methods, and developed many new methods that are not used anywhere else to obtain a greatly improved product.

For instance, a new process of production liquid salt hardening was developed for the selective heat treatment of the critical gears, sprockets, track rollers and front idlers so that the contractor can be assured of much longer life in these important parts.

The same fresh approach was used in the sound engineering of the tractor details. Each part is



THE EIMCO CORPORATION
Salt Lake City, Utah—U.S.A.



Eimco Tractor with loader attachment cleaning hot slag pocket at steel mill.

designed for strength and simplicity. The tractor must be compared, piece for piece, with its counterpart on any other tractor to appreciate its superiority of design.

For the user, this means longer life in the machine, more work without down time, and lower parts inventory.

Eimco tractors are in use all over the World — Most of the tractors have the Eimco Loader mounted on them. The critical test of any tractor is its ability to withstand the strain of heavy attachments, and the most abusive is the heavy-duty rock excavator and loader.

Other tractor manufacturers did not build into their design the extra strength required to absorb the unusual twisting forces and thrust loads in all directions that result from mounting a heavy attachment. A loader will in many cases add a working load in excess of the tractor weight. When Eimco built their Tractor-Loader there was no tractor on the market that was built heavy enough for these severe loads. Eimco's tractor has this additional strength — it was built to work efficiently and effectively with ALL attachments. Consequently, in the normal functions of a tractor it will give exceptionally long economical life.

COMPETITIVE TESTS

In many competitive tests and in applications so severe that no other tractor would take the punishment, the Eimco Tractor has proved its superiority.

Digging hard clay directly from the bank without drilling and blasting, at an open cut mine, found an Eimco Tractor with the 105 Loader matched against a redesigned shovel mounted on a popular brand tractor of comparable power and bucket size. The extra drawbar pull of the Eimco with torque converter

drive made it possible for the Eimco to dig and load easily 153 six-yard trucks in a day as compared with a hard-pressed 90 trucks for the conventional tractor. This mine immediately obtained its second Eimco.

SLAG POCKETS

The largest steel companies at twelve different plants use fourteen Eimco Tractors in their open hearth furnace slag pocket maintenance program. There is no harder job on any contract anywhere than this operation of breaking out solidified hot slag before a furnace is rebuilt. Working in temperatures from 1600° to 2000° F., many times the bucket is hooked under the hot bed of slag and the rear of the tractor raised into the air by its own power as much as 8 ft. and then allowed to drop, acting as a giant crowbar.

Under these conditions the Eimco operates on its front idlers only. Many of these tractors have more than 3000 hours service. NONE have had idler or roller trouble.

You will agree that this machine is built the way modern tractors should be built, and the way you have wanted tractors to be built. The Eimco Tractor had to be a more rugged simpler machine in order to obtain a position in the field of established tractors.

All of the tractor parts that have given you high maintenance costs on other tractors have been substantially improved and strengthened. Maintenance costs on the major trouble spots such as tracks, final drive, clutches and transmission have been cut in half. Based on the eighteen months of experience Eimco has had with these tractors in the field, it is estimated that your overall maintenance costs will be one-third less under similar

conditions than on your present equipment of comparable size.

SUBSTANTIAL SAVINGS

Here are the main reasons for these very substantial savings, and more reasons are given later:

Each part is designed for maximum strength regardless of total weight, since strength cannot be sacrificed when the part must do a certain job. There is no cheap weight added for the sole purpose of increasing the drawbar pull.

Details of the heavier track construction are given later, but probably the most important reason for negligible wear of the track assembly is that you do not drag one track to turn. Turns are made with both tracks in motion so that the tractor rolls around in its own length with one track running forward while the other runs reverse.

All conventional steering and master clutches have been eliminated and you never have to adjust clutches.

TRANSMISSION

The unique transmission (patents pending) is absolutely fool-proof and accomplishes what cannot be done on any other tractor. Without any clutch pedals or gear shifting levers, it is possible to shift gears under full speed and full power and to reverse the tractor instantly at all speeds.

The final drive assemblies are extremely simple and rugged. Shaft and gear stresses are substantially lower than on any other tractor. The same design standards that have been used in heavy duty mining machinery that often works ten



Digging in red clay at open cut mine.



Bulldozer mounted on Eimco Tractor on U.S.B.R. Wanship Dam Job. Operator was able to bulldoze along irregular face because of visibility and maneuverability in Eimco Tractor.



Slim's River crossing (Yukon) required large quantities of rip-rap broken from rocky ledges, at 40° below zero. Eimco Tractor with loader attachment handles 5 to 6 ton boulders.

to twenty years without repair have been used in the design of this tractor.

In the same way tremendously longer life has been designed into the ball and roller bearings used throughout this machine. All bearings are designed so that they should not ever wear out. Bearings have been designed for about 100,000 hours average life under maximum load conditions. Competitive tractors are built with bearings designed to give an average life of 20,000 hours or less. Your own experience with tractor bearing replacements will tell you how costly this one item can be.

In addition the roller bearings in the Eimco Tractor are mounted in separate removable steel bearing cages wherever possible, for protection of the gear housings and ease of maintenance. (See Figure 5a). This type of construction costs more to manufacture, but means large savings in upkeep.

Then to cushion the shock to all parts of the machine and to give even longer life to gears, bearings, and shafts, the finest fluid torque converter is used between the Diesel engine and the transmission. Extensive tests on trucks in the iron mines have shown that transmissions lasted five times as long with

a torque converter as with the conventional drive. The shock transmitted to the transmission under starting loads was 75% less with the torque converter, and engines had to be overhauled one-third less frequently.

All of these factors mean that this Eimco heavy duty tractor with a minimum of maintenance will give you many years of unequalled performance.



THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A.



Mud and water washed into roadways by torrential downpour were removed by Eimcos with loaders. The rollers and idlers are perfectly sealed — keep the lubricant in and the dirt and moisture out.



To place facing material on earthfill dam at W. W. Clyde job, operators preferred Eimcos because of easy handling, maneuverability and quick response to controls.

Balanced Design with Torque Converter Provides More Drawbar Pull

The most important factor in the amount of work that a tractor will do is the drawbar pull that can be developed by the tractor.

Horsepower rating of the Diesel engine does not determine the drawbar pull of a tractor. Maximum drawbar pull is obtained only by the proper balance between weight, traction and proper application of the torque or "push" available from the engine.

The Eimco Tractor with torque converter matched to the Diesel engine continually matches the speed

to the load. An increase in load automatically decreases the tractor speed without gearshifting so that the most efficient operation is obtained at all times.

With the torque converter, full drawbar pull is obtained even at a standstill. With tractors having conventional gearshifts, the engine would stall.

Tractors with a conventional manual gearshift transmission must be shifted to a lower speed range whenever the tractor overloads the

engine. These tractors must be stopped to shift gears.

The Eimco Tractor can be held and started on steep slopes with only foot throttle control. The fluid drive also allows smooth contact for pusher operations. The torque converter takes the place of the master clutch for picking up the load. This is the only crawler tractor on the market without a master clutch — no master clutch means no clutch wear.

The Eimco tractor with torque converter has an infinite range of speeds in each of the two-speed positions in both forward and reverse. In "low" the speed varies from zero to 2 miles per hour, and in "high" from zero to 5 miles per hour.

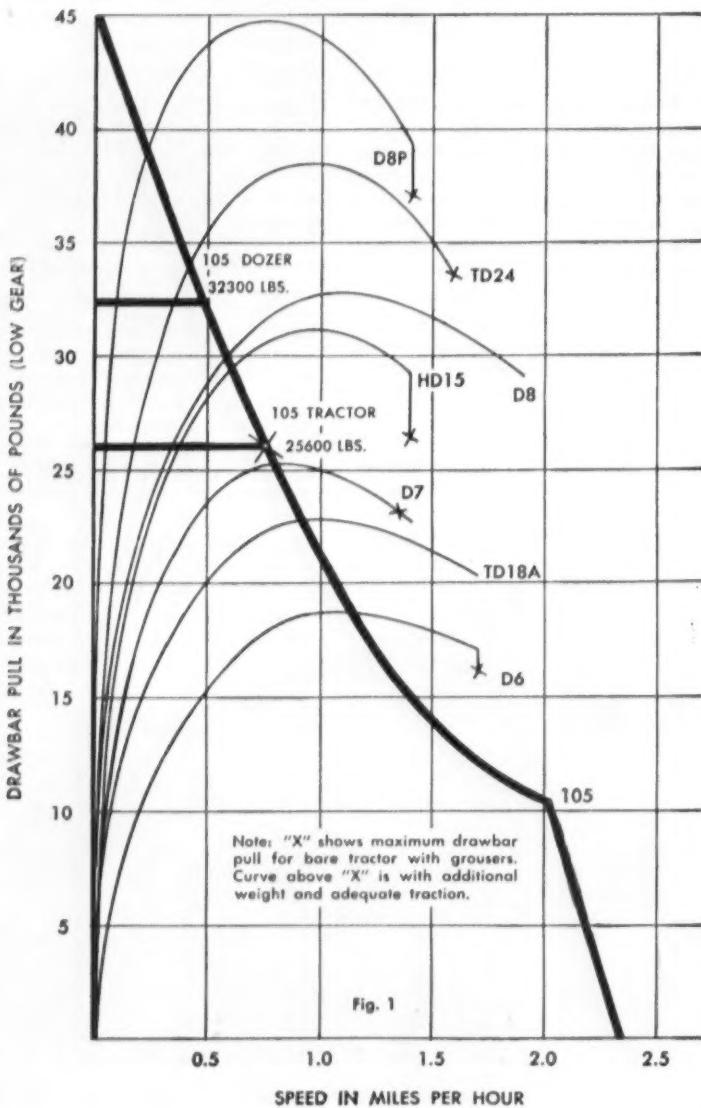
Conventional gearshift tractors are limited in drawbar pull by having fixed gear ratios and insufficient weight to use the maximum available drawbar pull. In these tractors increasing the horsepower of the engine will not increase the maximum drawbar pull of the tractor. A tractor with an engine that produces 150 horsepower, but that slips the tracks with an application of only 50 horsepower, obviously is wasting two-thirds of its power under maximum drawbar pull conditions—and you still have to buy fuel for the wasted power.

PROPER BALANCE

In the Eimco Tractor the engine, torque converter, gear ratios and weight are properly balanced to obtain most efficiently all of the drawbar pull available in the tractor.

The curves (Fig. 1) show the drawbar pull in low gear of a number of popular models of tractors available today, as compared with the Eimco 105 Tractor in low speed range. The data on the competitive machines is from the manufacturers' published data and the University of Nebraska tests.

First, you will notice how the 105 torque converter drive smoothly balances the speed to the load conditions. Maximum drawbar pull or "push" is obtained when the tractor is standing still. On all of the tractors with conventional gearshift



THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A.



Eimco Tractor pulling sheepfoot roller on airport tamping job.



Building breakwater in Syria. Ability to dig and carry with fast reversals make the Eimco popular.



High discharge loader attachment on Eimco Tractor loads iron ore into 11'0" high gondola.



Eimco Tractor handles scraper with complete visibility.

transmissions the drawbar pull falls off to zero as the engine speed is pulled down due to overloads. This means that just when you need the greatest push from the tractor when the heaviest loads are encountered at low speeds the conventional tractor will stall the engine. It is impossible to stall an Eimco Tractor engine through the torque converter.

You will also observe that the performance curve for the Eimco Tractor cuts directly across the curves for the other tractors. This shows how the balanced design of the Eimco produces more work at the lower speed under the hardest conditions than the heavy tractors, and more speed under the lighter work, all without gearshifting.

On these curves the "x" shows the maximum drawbar pull obtainable with the bare tractor with grousers. The curve shown above this "x" is only obtainable with additional weight and adequate traction.

The 105 bare tractor has a maximum drawbar pull of 25,600 pounds. When the bulldozer is added this increases to 32,300 pounds, and with further addition

of weight a maximum of 45,000 pounds drawbar pull can be obtained.

As an example from the curve, the HD-15 bare tractor has a drawbar pull of about 26,500 pounds. This increases to about 31,200 pounds with added weight at the maximum torque output of the engine. Above this, additional weight would not help.

It is seen that the Eimco Tractor and bulldozer will produce a greater drawbar pull than any but the very largest tractors. The Eimco Tractor will do the tougher jobs easier and will push or pull greater loads with the advantage of lower costs and greater flexibility.

Here is a summary of what Eimco Tractor design does for you in terms of maximum drawbar pull in pounds per engine belt horsepower:

Eimco 105	375
HD-20	370
HD-15	250
D8 Pusher	238
D7	230
TD-18A	226
D6	220
TD-24	215
D8	178

The Eimco Tractor gives you the most effective application of engine horsepower for heavy, tough and rough jobs.

The University of Nebraska tractor drawbar tests have recognized the important advantages of a torque converter tractor drive. Their Test "H" determines the continuous rated load of a tractor.

In the case of standard tractors with conventional gearshifts this continuous rated load is taken as 75% of the maximum drawbar pull test load. However, the Nebraska tests allow a continuous rating of 100% of the maximum drawbar pull test when a hydraulic torque converter is used because the torque converter automatically loads the engine by controlling the travel speed of the tractor according to the load applied.



THE EIMCO CORPORATION
Salt Lake City, Utah—U.S.A.

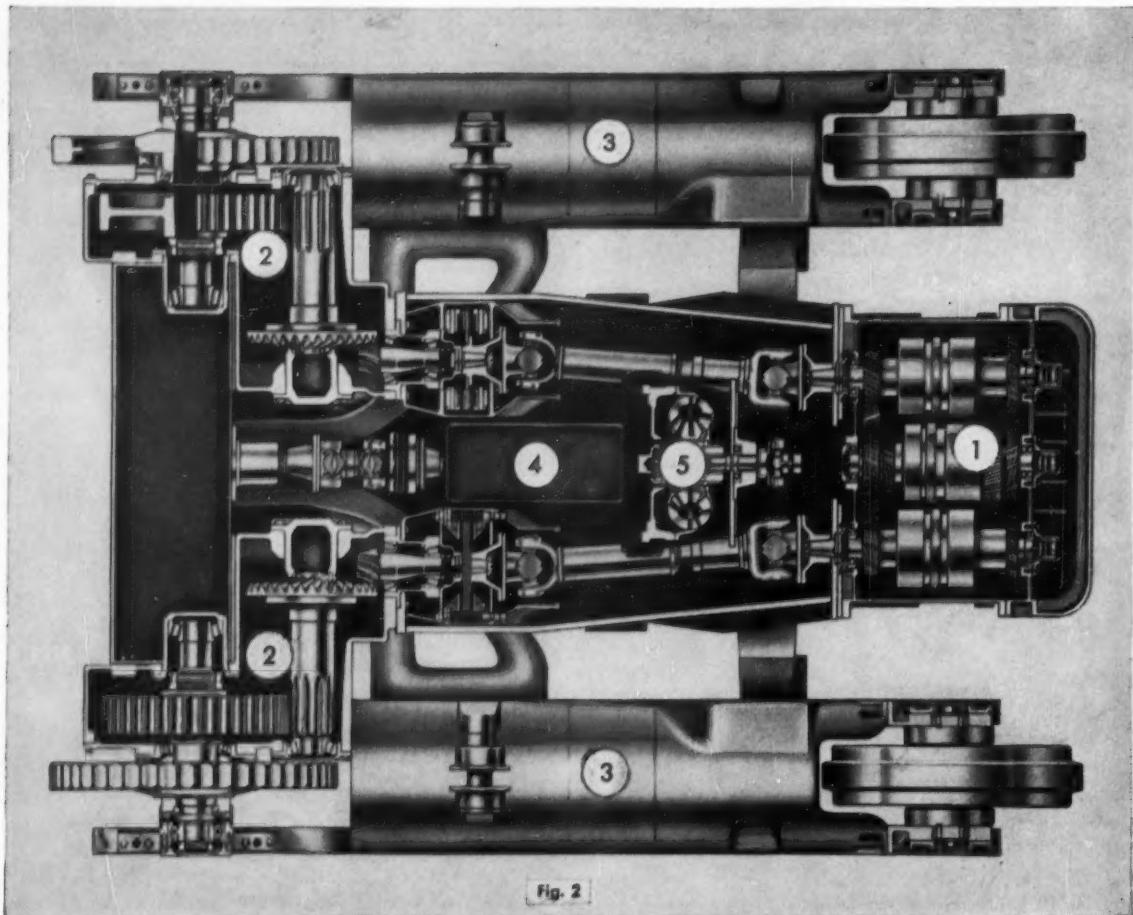


Fig. 2

Unit Construction for Easy Maintenance

1. **Transmission:** A complete self-contained unit which can be removed without disturbing other assemblies of the tractor.
2. **Final Drives.** Each final drive is a separate unit assembly which can be removed independently.
3. **Track Assemblies:** Easily disconnected from the final drives and main frame for removal as separate assemblies.
4. and 5. **Engine and Torque Converter:** The complete assembly can be removed as a unit or the torque converter can be removed alone without disturbing the engine or any of the other drive assemblies.

Each of these husky separate assemblies have been designed as a unit and built as a unit. This means not only simpler construction on the assembly line, but also reduces maintenance costs to a minimum.

If, for instance, the compact transmission requires maintenance

it is a simple matter to remove the complete transmission assembly to work on it or to replace it with a spare unit. None of the other major components has to be disturbed. Compare this with servicing the master clutch or gearshift transmission on a conventional tractor.

If desired, the transmission hous-

ing may be left in place and only the front cover removed exposing all of the gearing and clutch assemblies. A complete gear and clutch assembly can be replaced by a mechanic in not more than three hours.

Final drives are also easily removed, repaired or replaced. Either the complete final drive assembly can be removed from the side of the machine or the housing can be left in place and the final drive cover removed to expose all of the gearing. Removal of the housing cover allows easy replacement of the complete bull gear and shaft assembly.

These features all mean less down time on the job. The tractor user will recognize that this unit design will save him money. Every



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margin of increased production will enable contractors to shave their bid prices and realize greater profits.

To meet competition every contractor will have to use the most efficient trouble-free equipment he can obtain.

Experience with over 120 of these tractors in the field has resulted in a machine that is now perfected and trouble-free. The first machines were put to work under the toughest conditions to find out the weaknesses and correct them as soon as possible. The first tractor was delivered to Geneva Steel Works of the U. S. Steel Corporation for digging out the solidified slag and molten metal in the repair of slag pockets in open hearth steel furnaces. This is the toughest kind of job under conditions of high temperatures, abrasive dust, steam and excessive strains. This first machine has now been in operation over 3,000 hours over the past eighteen months.

TOUGH TESTS

Other machines in the first lot were put to work under equally tough tests and unusual conditions. One was in the desert country of Arizona and another in the frigid regions of the Yukon.

Naturally there were bugs in the first machines and these showed up quickly under this tough shake-down work. Some of the troubles were due to insufficient metal in the castings or inadequate structural sections that were too light. For example, the main frame was originally a built-up welded section including $\frac{1}{4}$ " plate webs. This frame developed trouble at an early stage and was changed to a hot formed section made from a single $\frac{5}{8}$ " plate, eliminating the welded joints and greatly increasing the strength.

As soon as any of these improvements were made, tractors in the field were changed by Eimco, even though the customer had experienced no difficulty.

Now that the original weak spots have been discovered and overcome, Eimco can claim less down time, lower maintenance costs and greater productive capacity than any tractor in its work class.



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Simple Controls Mean Operator Comfort

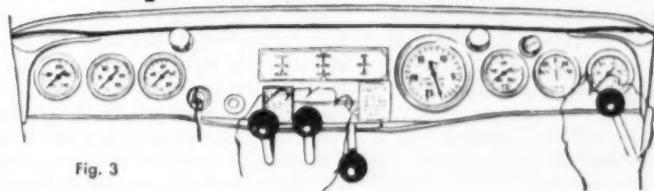


Fig. 3

The Eimco Tractor may be operated by one hand covering two small levers. Push both for forward motion, pull for reverse motion.

Each lever controls the track on its respective side. A twist of the wrist starts one track in forward motion and the other in reverse for a spin turn. Release one handle and it will automatically return to neutral for a gradual turn.

Attachments such as bulldozer or loader can be operated by the other hand.

There are no clutch pedals, no steering clutch levers, no master clutch control or manual gearshift

lever.

Like your modern automobile, all the movements are performed without effort of the operator.

Change between low speed range and high speed range may be made at any time without stopping the tractor by actuating the separate small handle. Either track or both may be reversed instantly at any speed.

Spin turns of the tractor mean accurate close control of the dozer blade and time saved in maneuvering. In narrow cuts the tractor can be turned around in its own length instead of having to back out.

Operator Can See What He Is Doing

The operator of a tractor belongs up front where he can see what he is doing. Operating a tractor from the conventional rear position is like trying to drive an automobile from the back seat.

The up-front position of the operator in the Eimco Tractor is of particular importance in dozer work, shovel feeding, pushing and front end shovel loading. In these and many other operations it is imperative that the operator see what he is doing.

Dozing up to the top of a steep embankment is always more effi-

cient if the operator can see the blade and has a tractor that will respond instantly to his touch, as in the Eimco Tractor.

Working in tight confined places close to buildings or other structures can only be efficient if the operator has good visibility. Many of you have seen gouges in brand new \$800 tires because the tractor being used to push a scraper was operated from the back seat. The Eimco Tractor eliminates cut tires, double passes where one will do, and inefficient work because the operator can see what he is doing.



Only the Eimco Tractor Gives You All These Features

1. Rear Power Take-off: Standard SAE Specifications for rear power take-off and drilling at the rear of the machine permit the mounting of standard auxiliary power take-off equipment. This shaft runs continuously with the engine and is not affected by track operation.

2. Drawbar: Special drawbars are provided in accordance with user's specifications. Standard drawbar is the short drawbar as shown. Drawbars are heavy duty steel construction in accordance with SAE Specifications for height and opening.

3. Radiator and Fan: Heavy duty oversize industrial type radiator has ample cooling capacity for long full load operation in desert temperatures. Blower fan is standard. Suction fan can be furnished optionally.

4. Air Cleaners: Oversize oil bath type air cleaners provide clean air for Diesel engine operation and require minimum of attention even in dry dusty working conditions.

5. Power Unit: The Diesel engine develops 120 horsepower at rated speed of 1800 RPM.

6. Torque Converter: Allison type for heavy industrial use. Designed to transmit all the power of the Diesel engine and matched to the engine. The torque converter cushions the load and reduces the shock to the tractor gearing. The converter automatically adjusts the speed to the load to give the greatest effort in the lowest speed range where it is needed.

7. Seat: A comfortable sponge rubber bucket-type seat provides a healthful alert posture for the operator. Movements required of the operator in order to efficiently work the machine are natural and easy.

8. Auxiliary Equipment Controls: Auxiliary controls are grouped at the right-hand of the operator. The upper handle controls the movement of the attachment, and the lower handle is provided if speed range selector is used. The handle with thumb ratchet button is the manual accelerator handle for fixed engine speeds.

9. Tractor Controls and Instruments: Tractor controls consist of three small levers immediately in front of the operator. Two of these

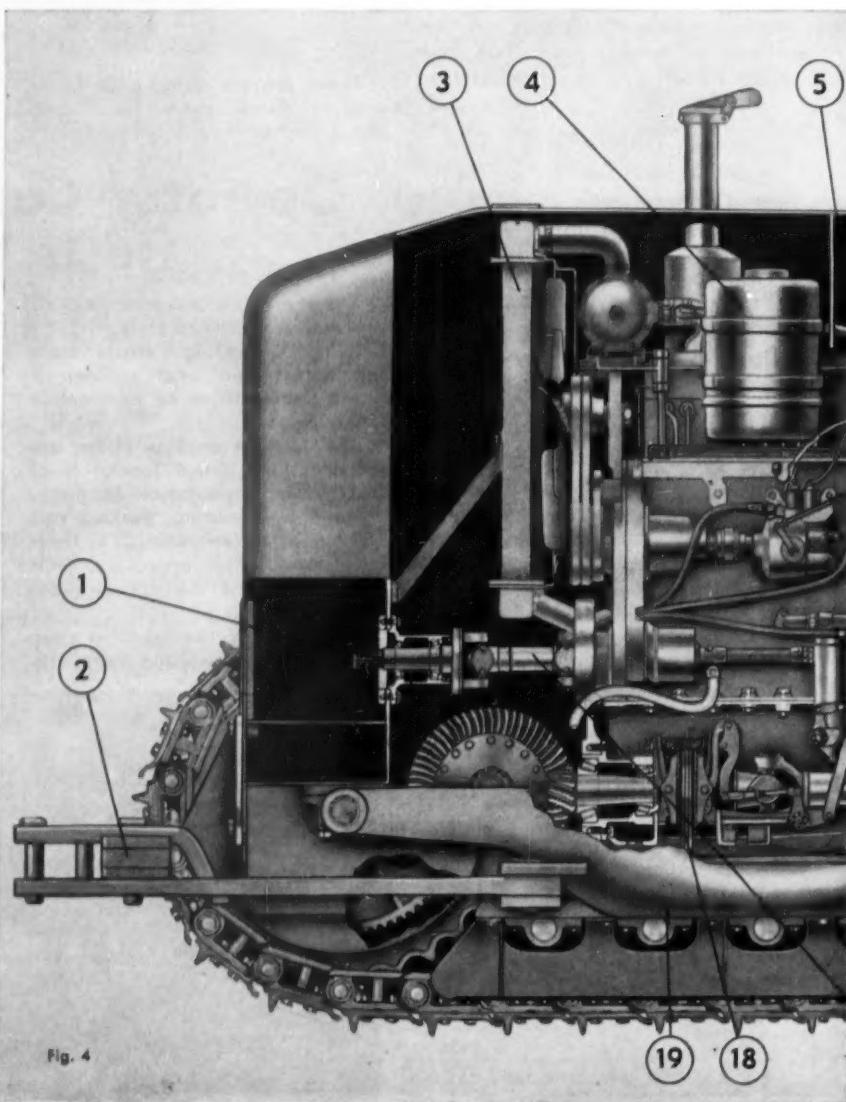
operated with one hand are separate locomotion controls for the crawlers on their respective sides. They may be operated together or separately. Push for forward motion and pull for reverse motion, or one in each direction for spin turns. The third lever is the speed changing lever which may be moved from one position to another at any time.

In addition to these controls a foot accelerator is provided along with a handle throttle at the side and parking brakes are provided with ratchets and hand release.

Instruments: The instrument panel includes dial type instruments for

converter oil temperature, converter oil pressure, drive oil pressure, engine oil temperature, ammeter, tachometer and hour meter, water temperature and engine oil pressure. There are also included two dash lights, a cigar lighter, starter switch and key-type switch.

10. Front Power Take-off: The front power take-off is furnished as standard equipment. Standard SAE drilling and mounting pads on the front of the tractor permit the use of any cable reel or hydraulic drive. Both front and rear power take-offs run continuously with the engine and do not stop when the main crawler transmission is operated.



(Advertisement)

The front power take-off drives through the torque converter and is subject to speed variations due to loads on the converter.

11. Main Transmission: Eimco's great new Unidrive achieves supremacy in engineering advancement of tractor power transmission.

This is a compact unit containing all of the gearing and clutches for speed changing and independent full power to each track, permitting reversal of one track and forward motion on the other at the same time, or moving both tracks in the same direction. This transmission permits instant reversal of the machine at any speed. It permits shifting from one speed to another in motion and under full load.

The Eimco transmission combines all of the best features of torque converter, constant mesh gearing

and hydraulically actuated friction clutches with a sealed oil bath and pressure lubrication to all wearing parts.

The oil-cooled positive engagement clutches never need adjustment. The precision helical gearing is alloy steel, carefully heat treated and micro-shaved for years of quiet operation.

12. Track: The track for the Eimco Tractor is heavy duty all-steel construction using the best in alloy steel cast pads, forged links and extra heavy design for pins and bushings.

The special attention to the track and its component parts make it one of the real heavy duty features of the 105.

Conventional variations of track shoe widths and types are available.

13. Track Rollers and Carrier Roller: Strength in the track rollers is another outstanding feature of the Eimco. These rollers, like every other part in the tractor, have been designed to eliminate this weakness found in other types of crawler units.

Note:

- (1) The roller itself is a one-piece alloy steel casting deeply heat treated for maximum wear;
- (2) that the shafts are extra large in diameter, precision finished and hardened;
- (3) that the tapered roller bearings are extra oversize and each fitted in its own steel bearing cage;
- (4) seals are precision lapped for complete protection;
- (5) large lubricant capacity for longer service.

14. Electrical System: The standard electrical system is 24-volts. For operation in warm climates, 12-volt electrical system may be used. The machine is equipped with heavy duty industrial type battery, starter and generator. Lights are available at extra cost and include two lights forward and two in the rear.

15. Hydraulic System: The tractor hydraulic system is low pressure (150 psi.) with the one system supplying the torque converter clutches, gearing and complete forced feed lubrication.

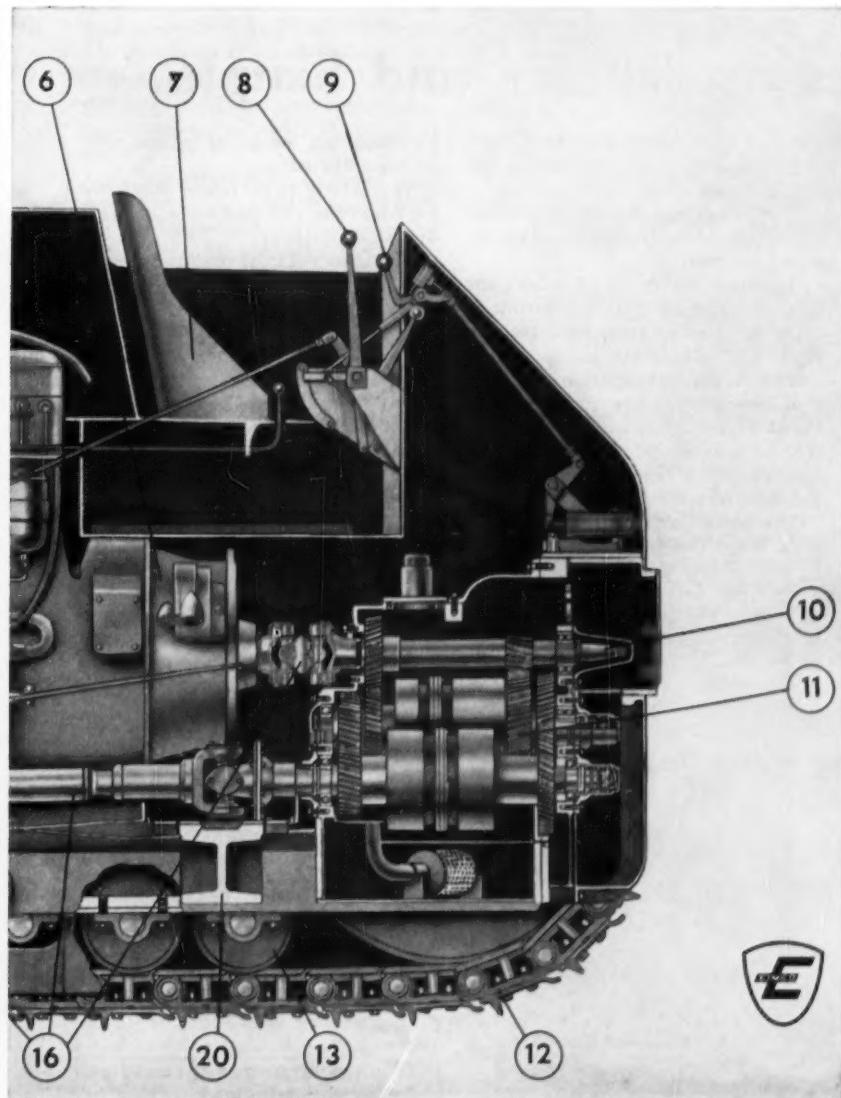
16. Universal Joints: Precision made oversize for long uninterrupted service.

17. Main Frame: Hot formed, deep frame section carries equalizer bar and permits the mounting of attachments inside the tracks on the main frame.

18. Brakes: A precision type air cooled disc brake is used on each drive shaft adjacent to the final drive housing. Brakes are independently actuated from the cab by means of foot pedals, and can be set for parking brakes.

19. Diagonal Brace: Hollow cast alloy steel diagonal braces are welded to the track frame. Correct alignment of the tracks is maintained by the low deflection under heavy loads.

20. Equalizer Bar: The heavy duty cast alloy steel equalizer bar permits the track to oscillate a full 12" without throwing strains into the main frame. This heavy beam-type construction is another instance of the superior construction and great strength.



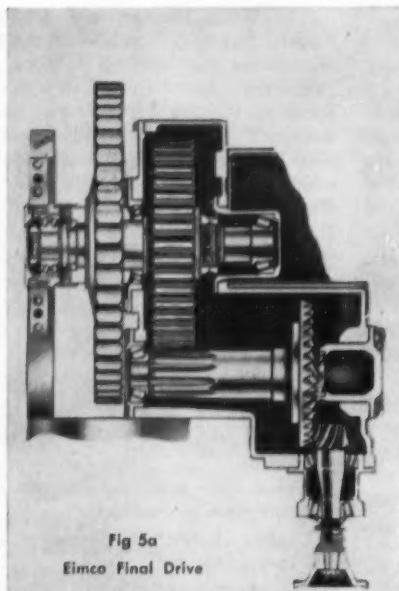


Fig. 5a
Eimco Final Drive

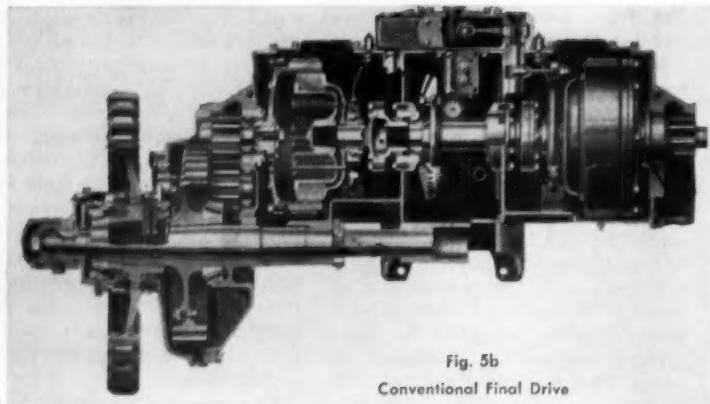


Fig. 5b
Conventional Final Drive

Comparison of a conventional Tractor Final Drive Assembly (Fig. 5b) with the Eimco Final Drive (Fig. 5a) reduced in the same proportions.

Final Drives are Husky and Simple

One of the previous troublesome weaknesses in tractors has been the final drive assembly. The Eimco final drive has been made strong enough to completely eliminate these troubles.

The obvious simplicity of the Eimco final drive allows stronger shafts and gears, larger bearings and greater strength throughout.

There are no clutches, brakes, springs, hollow shafts, or other gadgets in the Eimco final drive assembly.

The two final drive assemblies are identical, except that the gear housings are left and right-hand.

The Eimco sprocket shaft is solid and short for strength and rigidity.

All of the bearings are roller anti-friction type mounted in separate steel cages. This means that if a bearing should fail the final drive

housing will not be damaged, and the bearing and cartridge are easily replaced.

Gear housings are alloy cast steel of extremely heavy construction instead of cast iron.

The sprocket and final drive gear are mounted on tapered serrations on a solid alloy steel heat treated shaft 5½" diameter.

This husky construction provides the strength necessary for peak loads many times higher than the standard overload capacity usually considered in the design of other manufacturers.

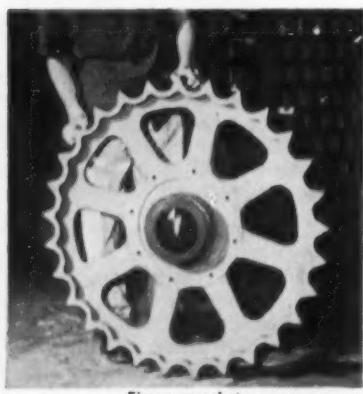
The pinion and gear are removable from the final drive housing

by removing the cover on the side of the gear case.

The whole final drive assembly may be removed and installed as a unit if necessary.

The sprocket is of cast alloy steel. It is much larger and heavier than sprockets on comparable machines.

The sprocket is heat treated in a special liquid flame hardening process that was developed specially for the selective heat treatment of these parts. This treatment gives the teeth of the sprocket an unusual hardness for long life and maximum toughness for protection against damaging abrasive rock and ore.



Eimco sprocket.

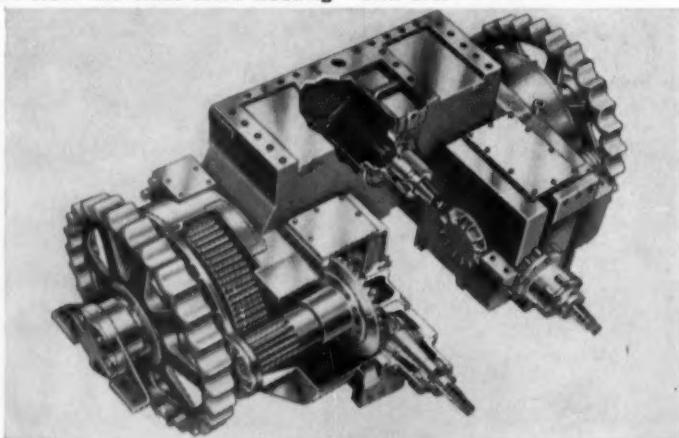


Fig. 6 Eimco dual final drives.



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Revolutionary New Transmission Design is Heart of Eimco Tractor

The Eimco transmission is the only tractor transmission that reverses without changing the direction of rotation of the gears.

Think what this means! Reversals of the tractor can be made instantly without the shock to the transmission that would come from gear reversal. All of the reversal of motion is absorbed smoothly and quietly on metal oil bath clutch plates. All of the clutches and gears for changing speed or reversal of direction are enclosed in this one compact housing.

The tractor transmission is by far the simplest and most fool-proof of any ever built. Every gear is in constant mesh, (there are no sliding gears) and all gears and clutches run in a bath of cooled oil.

This unique transmission (patents pending) is the supreme engineering advancement of tractor power application.

The all-metal clutches never need adjustment. A constant even clutch pressure is maintained during the entire life of the clutch.

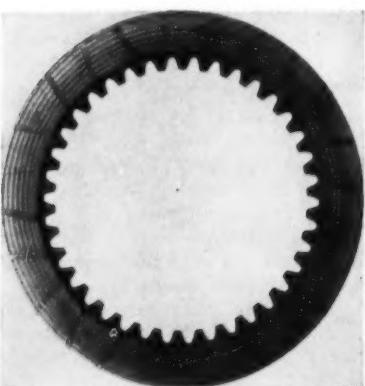


Fig. 7
Clutch plate after 2000 hours.

The photo (Fig. 7) which has not been re-touched in any way shows a clutch disc removed from one of the tractors after it had been in operation over 2,000 hours of heavy service. The clutch disc shows little, if any, wear and the rubber stamped part number is still visible on the face of the disc. The circular and radial grooves seen in the photo provide a full bath of

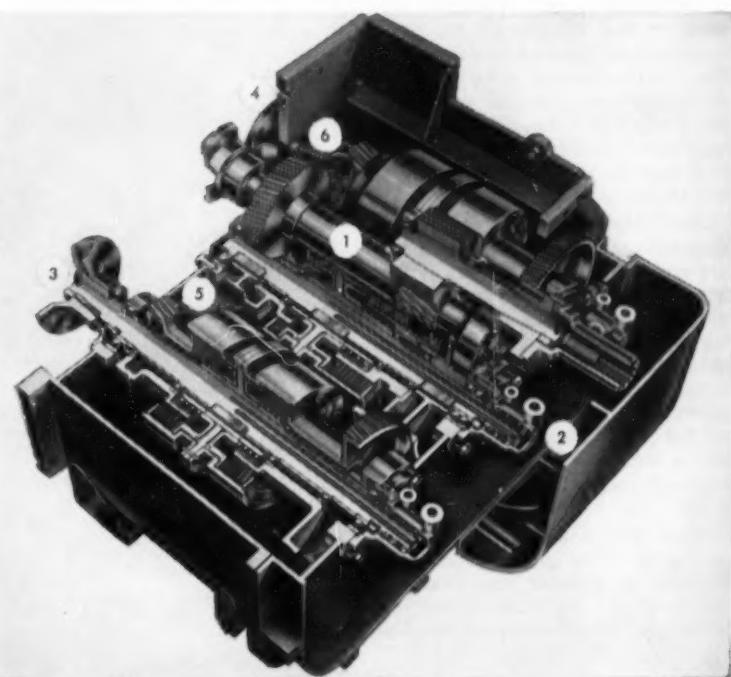


Fig. 8

Eimco Unidrive Transmission with gears that never reverse rotation and clutches that never need adjusting.

lubrication across the clutch face at all times.

The shaft arrangement in the transmission is shown in Figures 8 and 9. Shaft #1 is the power input shaft connected directly to the torque converter driving from the Diesel engine. This shaft turns constantly while the engine is running. Shafts #3 and #4 are the individual drive shafts to each of the final drives. These shafts may be independently reversed so that either

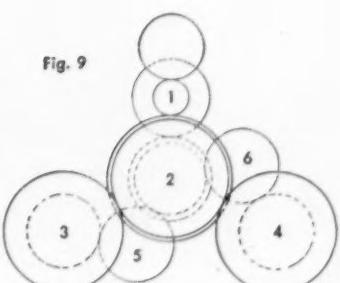
track may be driven forward or reverse for spin turns.

All of the gears and shafts are alloy steel with gear teeth micro-shaved for years of quiet operation. Bearings are of oversize design and anti-friction throughout.

For maintenance the complete transmission unit can be easily removed and replaced as an assembly without disturbing any other part of the tractor. If desired, only the front cover may be removed leaving the transmission case in place so that the individual clutch shaft assemblies may be repaired or replaced.

Gearing is all on parallel shafts without any highly stressed planetary and sun gear construction.

The Eimco transmission is undoubtedly the finest on any tractor and is years ahead in design for simplicity of control and ease of maintenance.



Parallel shaft gear arrangement of cutaway shown in Fig. 8.



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New Track and Roller Design Eliminates Major Tractor Trouble Spots

An entirely new approach was used in the design of the track assembly so that this vital part of the Eimco Tractor would have negligible maintenance cost. The basic design of the tractor support was developed to reduce the wear and tear on the track assembly to the absolute minimum.

Probably the main reason for excessive wear of the tracks and rollers on conventional tractors is that it is necessary to drag one track while turning. The Eimco Tractor turns with both tracks in motion by driving one track forward and one reverse so that there are no abnormal side loads and excessive wear on the track parts. The Eimco Tractor swivels to turn instead of limping around "with one foot dragging".

Both tracks are always in full contact with the ground because of the heavy pivoted equalizer bar which allows the tracks to oscillate even with attachments mounted on the tractor.

The weight of the Eimco Tractor and its attachments is evenly distributed full length of both tracks so that there are no severe overloads at any point along the track.

The heavy cast steel hollow section diagonal braces resist side

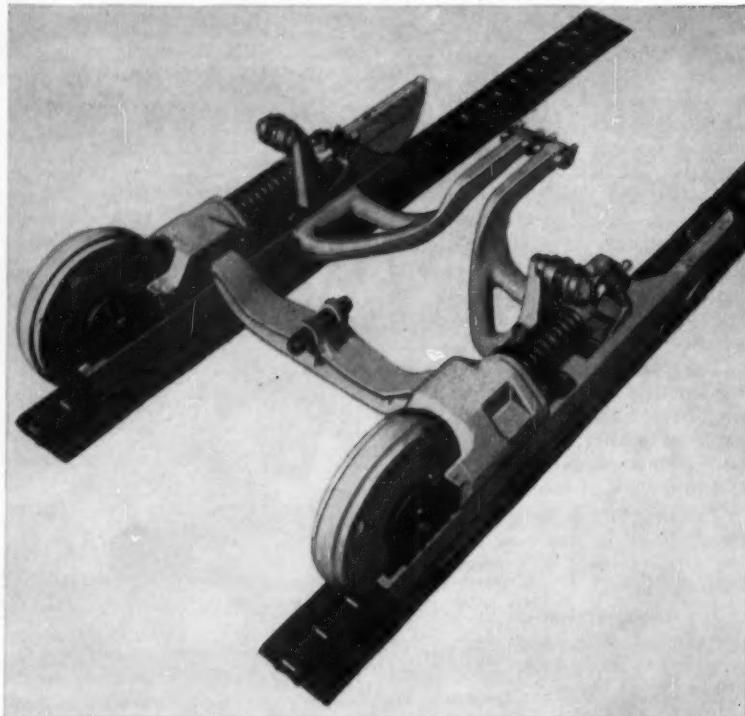


Fig. 10 Track assembly showing pivoted equalizer bar and diagonal braces.

loads on the tracks, form the pivots for track oscillation and maintain accurate track alignment.

All of the track parts are designed for maximum strength from forged or cast heat-treated alloy steel. Comparison with conventional tractors will show the over-size strength of these parts.

Front Idlers: These are of solid web one-piece alloy steel construction with the same type of roller bearing mounting in cages as used in the track rollers. Oversize steel shaft, precision lapped seal plates and bellows-type seals in alloy cast steel caps are used for long service and maximum strength.

NOT ONE roller bearing assembly of the Eimco track roller or front idler has failed, although Eimco tractors have operated in the excessive temperatures of hot desert sands and open hearth steel furnace slag pockets, the frigid areas of the Yukon and the mud and slime of Eastern Seaboard tornado areas—building breakwaters in Syria, highways in tropical South America, clearing jungles in Africa and digging tunnels in Quebec.

Eimco has long been recognized as a leader in the development of electric furnace alloy cast steel with

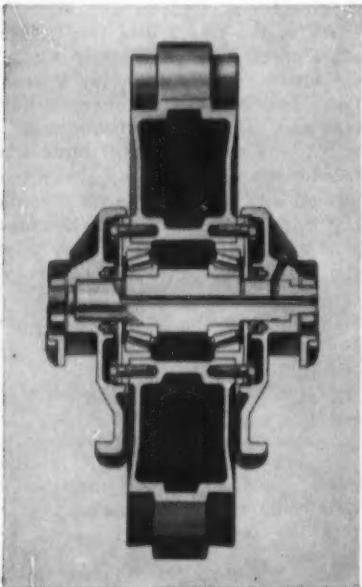


Fig. 11

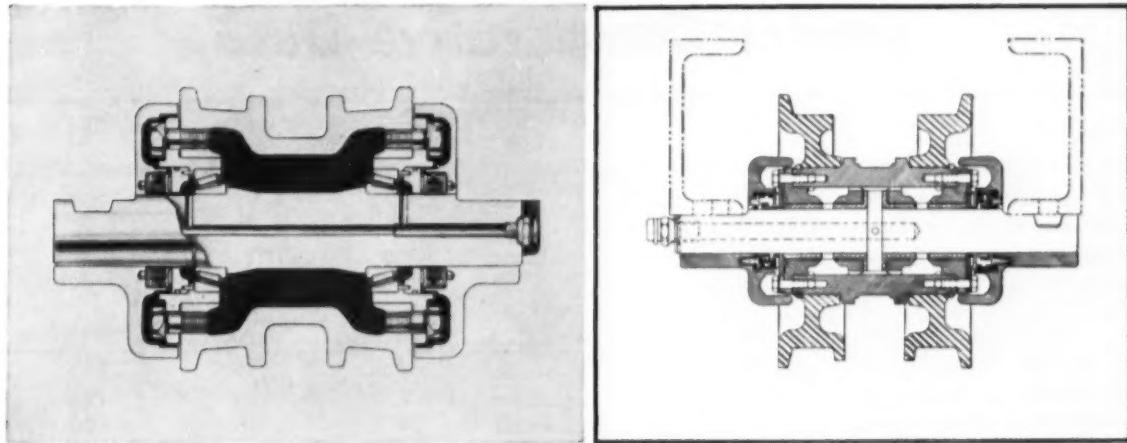
Cutaway view of front idler assembly.



Bottom view of rugged tractor construction.



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Eimco all steel track roller assembly.

Conventional track roller bushing design.

Fig. 12

special emphasis on the toughness, abrasion resistance and fatigue strength necessary to make steel parts last longer. This knowledge has been built into all the castings that go into the Eimco Tractor.

Track Rollers: Everything possible has been done to design for strength and endurance so that the 105 can operate without failure from track rollers. The roller is made of a one-piece alloy-steel casting specially liquid salt flame hardened for maximum wear. The track roller shafts are extra large diameter, also of heat treated alloy-steel.

Tapered roller bearings with high capacity to give exceptionally long life are used in the track rollers. The bearings are each fitted in a steel bearing cartridge. This cartridge provides a perfect fit at all times for each bearing, allows easy replacement in the field if

necessary and prevents damage to the track roller.

The Eimco is the only tractor with track roller assemblies mounted on roller bearings in separate cartridges. This expensive construction prevents deformation of the bearing seat due to loads on the track roller. Also, the roller bearings do not develop play and looseness so that the important sealing surfaces are maintained. This means that the lubricant will not leak. The large lubricant reservoir in the roller provides excellent bearing protection with long operation between greasings.

Shown in Fig. 12 is a comparison of the Eimco track rollers with the standard track roller assembly of a popular make of tractor. Note the simple sturdy construction with its large lubricant storage.

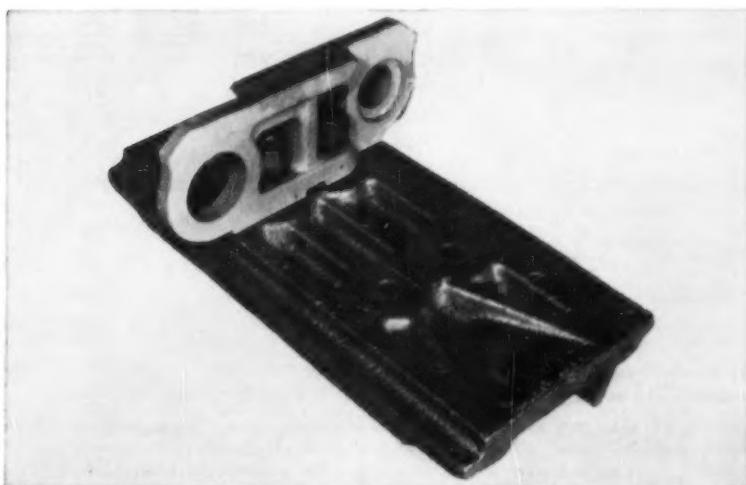
This is typical of the improved

Eimco design that means better life, longer intervals between service periods, less maintenance and more dependability.

Track Link Assemblies: Heavy alloy-steel forgings specially heat-treated are used throughout. Track pads are salt bath heat-treated alloy steel with or without grousers. The bolting face of the track pads is milled and a keyed lock locates the pad on the track link to take all of the strain and shear off the track bolts. Track links are machined on a special five-position, double spindle boring mill developed by Eimco for perfect alignment and accurate fit of the links.

Track pins and bushings are also high strength steel with special heat treatment.

Conventional types of track shoes in widths up to 30 inches are available for the tractor.



Track shoe and link keyed assembly.



Forged alloy steel link.



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(Advertisement)

Tractor Comparative Data

	EIMCO 105	CAT D6	CAT D7
Belt Horsepower (Sea Level).....	120	85	108
Drawbar Horsepower (Sea Level).....	Torque Conv.	75	90
Weight of Tractor Only, Lbs. (Std.).....	27,000	17,340	26,325
Drawbar Pull, Lbs. (Hi Gear).....	15,800	3,620	4,840
Maximum Drawbar Pull, Lbs. (Lo Gear) with adequate weight and traction.....	45,000	18,700	25,250
Speed, FPM (Hi Gear).....	0 to 480	580	528
Speed, FPM (Lo Gear).....	0 to 200	150	123
Width of Std. Track Shoe.....	24	16	20
Width Max. Shoe With Wide Ga. and Dozer.....	24	20	22
Length of Track on Ground (Center of Sprocket to Center of Idler).....	95	85½	94½
Area of Ground Contact, Sq. In. (Std. Shoe).....	4,560	2,744	3,775
Area of Ground Contact, Sq. In. (Max. Shoe).....	4,560	3,430	4,153
Unit Pressure on Tracks, psi. (Std. Shoe, Tractor Only).....	5.92	6.32	6.97
OVERALL DIMENSIONS (INCHES):			
Length.....	151-5/16	147-7/16	167½
Height.....	78	75½	81¼
Width (Wide Gauge, Std. Track Shoe).....	98	94½	97
Track Gauge (Wide).....	74	74	74
Ground Clearance.....	11	12½	15½
No. of Track Rollers (Each Side, Standard).....	6	6	5
Track Roller Diameter.....	8¾	8	8½
Track Roller Shaft Diameter.....	2¾	2¼	2½
Track Pin Bushing Diameter.....	2-7/32	2½	2¾
Track Pin Diameter.....	1-17/32	1-7/16	1¾
Track Shoe Bolt Diameter.....	¾	9/16	¾
Height of Grouser.....	2¾	2½	2¾
Pitch of Track Link.....	7½	6¾	8
Sprocket Pitch Diameter.....	34.9	30½	33½
Type of Engine.....	4 Cy. Cummins	4 Cy.	4 Cy.
Number of Cylinders.....	4	6	4
Bore.....	5½	4½	5¾
Stroke.....	6	5½	8
Piston Displacement, Cu. In.	495	525	831
RPM Governed at Full Load.....	1800	1600	1000
RPM at Max. Torque.....	1050	1000	775
Piston Speed (FPM).....	1800	1467	1333
Cooling System (U. S. Gallons).....	9½	14½	17
Crankcase (Quarts).....	20	22	22
Transmission (Quarts).....	128	42	43
Final Drive (Each-Quarts).....	68	9.5	23
Fuel Tank (U. S. Gallons).....	60	48	70
Control.....	Hyd.	Mech.	Hyd.-Mech.
Price, F.O.B. Factory.....	\$15,950†	.....	.....

Notes: Above is from Manufacturers' data or University of Nebraska Tests.

All dimensions are in inches except as noted.

Auxiliary equipment available at extra cost: Scrubber for underground operation, ether starting or glow plugs, air starting, lights, special drawbars, winter enclosed cab, trouble light, bulldozers, loaders, hoists and winches.



(Advertisement)

Tractor Comparative Data

CAT D8	A-C HD-15	A-C HD-20	I-H TD-18A	I-H TD-24	Other	Other
185	124	175	102	180	.....	.....
150	109	T.C.	89	148	.....	.....
38,155	27,850	41,800	23,475	39,245	.....	.....
7,580	5,840	35,000	4,870	4,892	.....	.....
32,900	31,200	65,000	22,850	38,600	.....	.....
510	510	0 to 616	502	686	.....	.....
167	123	0 to 264	150	141	.....	.....
22	20	24	20	22	.....	.....
24	24	28	22	24	.....	.....
99½	96-5/16	106%	84%	104½	.....	.....
4,389	3,853	5,118	3,385	4,598	.....	.....
4,788	4,623	5,971	3,724	5,016	.....	.....
8.69	7.23	8.01	6.94	8.15	.....	.....
192½	172-13/16	190%	158½	182½	.....	.....
86	83-15/16	94-5/16	79	89%	.....	.....
103¾	96¼	109¼	94¼	102	.....	.....
78	74	84	74	80	.....	.....
10½	14%	16%	14	13%	.....	.....
6	6	6	5	6	.....	.....
8½	8	10	10	9	.....	.....
2¾	2½	2½	*	*	.....	.....
2¾	2½	2%	2%	2%	.....	.....
1¾	1¾	1%	1%	1%	.....	.....
%	%	29/32	%	%	.....	.....
2-19/32	2-19/32	2¾	2¼	2¼	.....	.....
8	7¾	9	7½	8½	.....	.....
36¼	34	39	35	39.6	.....	.....
4 Cy.	2 Cy.	2 Cy.	4 Cy.	4 Cy.	.....	.....
6	6	6	6	6	.....	.....
5¾	4¼	5	4¾	5¼	.....	.....
8	5	5.6	6½	7	.....	.....
1246	426	660	691	1091	.....	.....
1200	1600	1700	1350	1375	.....	.....
800	900	800	800	800	.....	.....
1600	1333	1588	1463	1604	.....	.....
25	11¾	15	26	37	.....	.....
34	20	30	26	30	.....	.....
41	34	39	30	48	.....	.....
20	22	30	5½	9	.....	.....
69	91½	120	60	85	.....	.....
Mech.	Hyd.	Hyd.	Mech.	Hyd.	.....	.....
.....

*Signifies information not available.

†Standard equipment includes: Electric starting, heavy duty crankcase and track guards, muffler, heavy duty air cleaner, heat-treated track shoes, front and rear power take-offs, rain cap, sponge rubber seat, large front idlers, all steel transmission and drive cases, torque converter, hour meter, tachometer, cigar lighter, dash lights, key lock switch, complete instruments for converter, engine and drive oil pressure and temperature, ammeter, water temperature gauge, and drawbar.



Try the Eimco Tractor On Your Own Job

The whole story of American Industry is the growth of the pioneer, who has usually been the "little fellow" with an idea. He has had the courage to risk because of his confidence in our American competitive free enterprise system. He has had the conviction that the buyer in our good old U.S.A. would give him a chance to prove himself and his product.

Eimco asks only this chance — to prove to you, "Mr. Tractor Buyer," that the machine here described is indeed that better machine you want.

Before you buy your next tractor, give Eimco this chance to demonstrate on your job. There are no obligations — no strings attached.

Use it for thirty days and satisfy yourself.

You are invited to visit Eimco's big factories in Salt Lake City to see for yourself the more than a half million square feet under roof of modern manufacturing plant devoted to the building of Eimco machines; to see for yourself the rugged precision construction that this story has described.

Please consider these additional important points: this tractor is not the whim of a new firm in the heavy equipment field. Eimco has been in business for seventy years — more than thirty years building heavy, expensive self-propelled machines for the mining industry. Today there are more than 15,000 Eimcos in use throughout the world

— some of them for more than twenty years continuously. Ask any of your friends in the Mining Industry or the Tunnel Contractors. They'll all tell you "You can't beat an Eimco."

Remember this also — your Eimco Tractor carries a one year warranty. You don't need a big repair shop or a large parts depot at your back door.

In the near future there will be Dealers in your territory. In the meantime, there are over fifty Eimco Sales and Service Engineers throughout the Country and many more throughout the Export Markets. Please call the nearest Eimco Branch Office and they will have a man knocking on your door the next morning.



THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

BRANCH SALES AND SERVICE OFFICES

New York, N. Y., 51-52 South Street
Birmingham, Ala., 3140 Fayette Ave.
El Paso, Texas, Mills Building
Chicago—301 So. Hicks Rd., Palatine, Ill.
Duluth, Minn., 216 E. Superior St.
Kellogg, Idaho, 307 Division St.

San Francisco—637 Cedar St., Berkeley, Cal.
London W. 1, England, 190 Piccadilly
Houston, Texas, 4008 Purdue St.
Pasadena, Calif., 434 No. Lake Ave.
Baltimore, Md., P. O. Box 1052
Pittsburgh, Pa., Investment Bldg.

AFFILIATED EIMCO COMPANIES

Societe Eimco
29 Rue De Mogador
Paris 9, France

Eimco (Great Britain) Ltd.
Gateshead-on-Tyne 11
Co. Durham, England

Eimco Italia, S. P. A.
Via Senato 11
Milan, Italy

Eimco (South Africa) Pty. Ltd.
136 Kindon Road, Robertsham
Johannesburg, South Africa



two-way side dumping eliminates truck tie-ups ... keeps rock production high

Assurance of constant, smooth flow of rock from quarry to crusher and elimination of costly truck delays have been achieved by Buffalo Crushed Stone Co. of Bowmansville, N. Y. through a flexible system of two-way side dumping at the crusher.

The greater flexibility of this system was achieved by converting from single truck units to truck-trailer combinations—thus doubling payload capacity for stepped-up production. Since all the dump bodies are designed for two-way dumping,

the trucks can roll in on either side of the crusher. Remote-control overhead dumping system enables one man to control the feeding rate and the crusher operation. Feed is uniform...truck delay is eliminated.

Each of the six trucks hauls 28 tons in two side-dump bodies; 14 tons on the truck and 14 on the trailer. They handle grades up to 10% and roll at speeds up to 27 m.p.h. on the level. Each truck makes 22 trips daily between the quarry and the crusher, hauling a total of 3700 tons and using only 1.2 gallons

of diesel fuel per hour per truck.

In switching to tandem operation, Buffalo Crushed Stone Co. knew they had a job calling for trucks that "have what it takes." Result: They bought Macks—six Model B-61 six-wheelers powered by Mack Thermodyne® Diesels, and equipped with heavy-duty Mack transmissions to meet stiff grade requirements.

On your job, too, Mack trucks can make the big difference by hauling more—for less.

2716

MACK TRUCKS Empire State Building, New York 1, N. Y.
(Advertisement)

HOW TO: slash base construction costs

. . . raise load-bearing standards

. . . save thousands of maintenance dollars

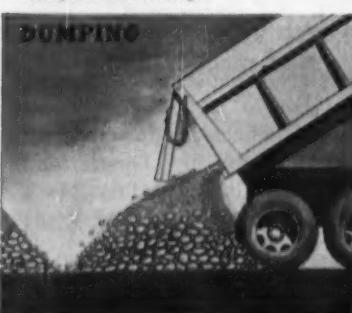
with the **BIG NEW 1955 SEAMAN**



Idaho. High densities are obtained in soil-cement construction with the SEAMAN Self-Propelled Mixer. Here the SEAMAN is mixing, blending and assembling aggregates and mixing in the water increment.

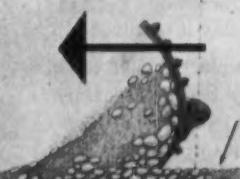


Compaction roller follows immediately behind SEAMAN TRAV-L-PLANT. The SEAMAN finishes to fine grade and crown leaving mix ready for final rolling.



When gravel is dumped, it forms in piles. Larger stone falls first, the fines last. This segregated condition is highly unstable.

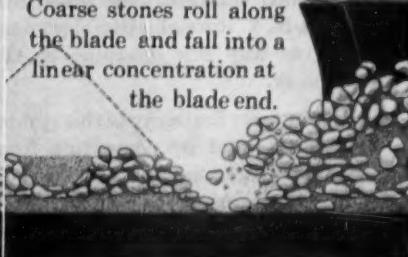
SPREADING



When those piles are leveled alternate pockets of fines and coarse are formed. A base so constructed will soon ravel and break up.

WINDROW SPREADING

Coarse stones roll along the blade and fall into a linear concentration at the blade end.



In spreading windrows to final grade fines are concentrated in the windrow "heart." Some fines remain as a pocket, others sift to the bottom. Such segregation also is very unstable.

with 51 improvements!

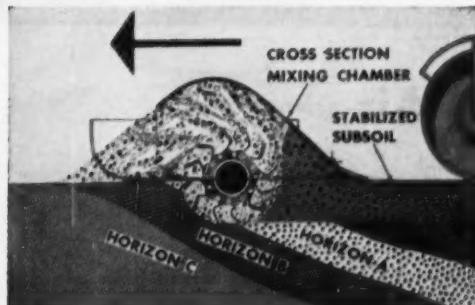


PULVI-MIXER

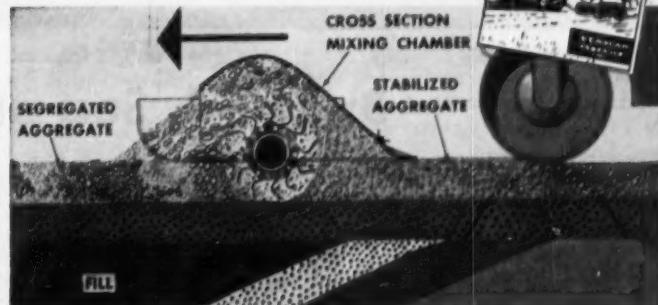
SAVES MAINTENANCE DOLLARS. Stones or aggregates of any size when mortar-locked by the SEAMAN-process are highly immovable, consequently resist moisture penetration and the ensuing damaging effect of traffic. This is true whether the course be simple gravel stabilization or of a higher type employing any of the many available binders. A SEAMAN constructed base or sub-base stands without spring break-up, without raveling, washboarding or maintenance requirement.

EARTH FILLS AND EARTH DAMS. Those same SEAMAN principles, — the elimination of voids, and the blending of soils produce densities in earthwork that range 95% to 100%. Very important is the inter-mixing of the various soil types found in fill material so that uniform reaction to moisture and compaction will result.

MIX STABILITY



Here the PULVI-MIXER stabilizes sub-base by blending soil horizons (A, B, C) to attain uniformity in moisture, density and thickness. This prevents sub-base failure.



Here the SEAMAN processes aggregate for the base, correcting by proper assembly of materials, an always-present segregated condition. The coarse material is keyed and interlocked, voids are filled with fines to securely mortar-in the larger aggregates.

The SEAMAN Self-Powered TRAV-L-PLANT. 7 ft. mixing width. Gasoline or diesel powered. Equipped with pump, tachometer assemblies, volumetric meter and spray bar for application of bitumens or water.



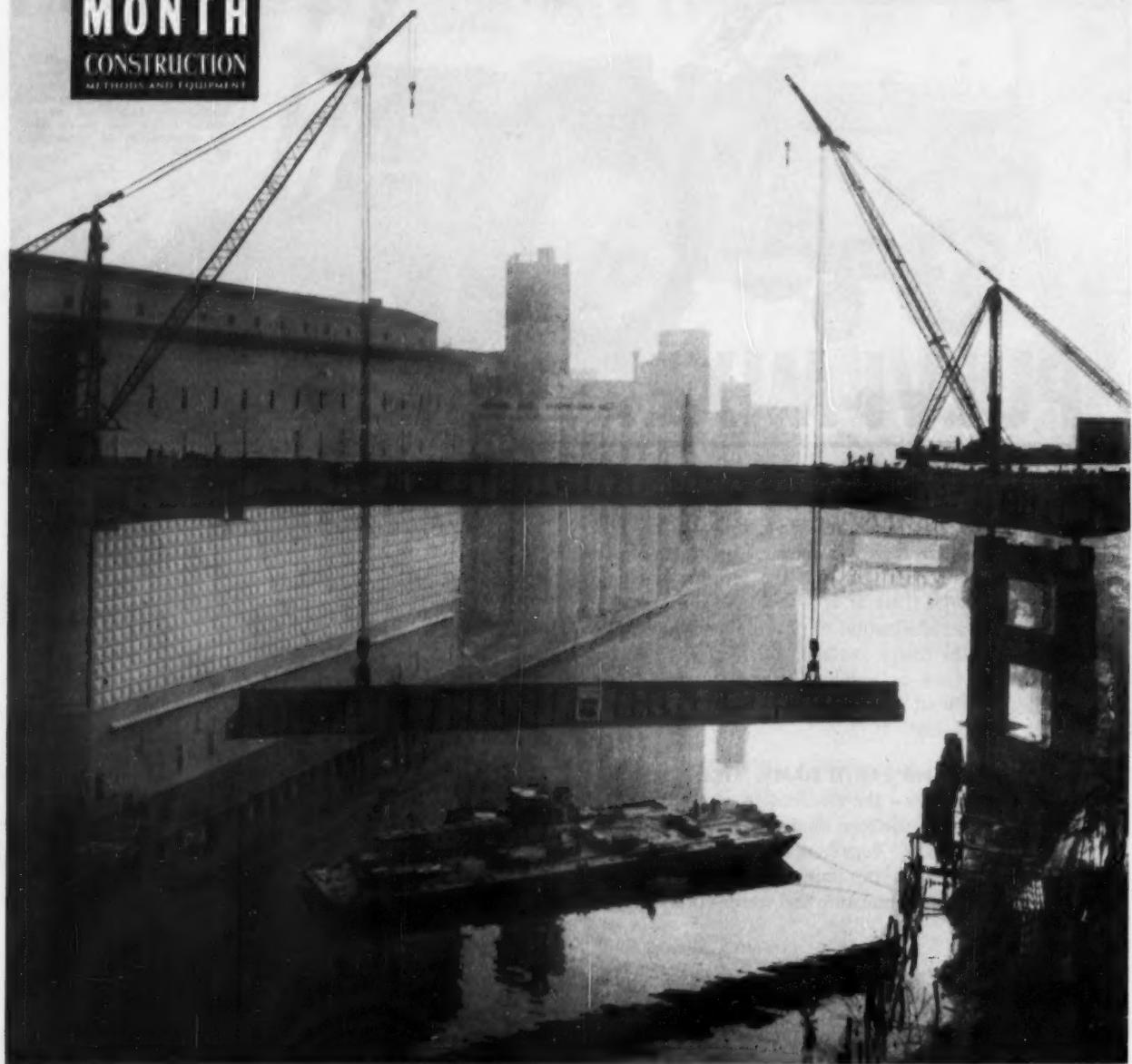
SEAMAN TRAV-L-PLANT in bituminous city street construction.

SEAMAN MOTORS, Inc.
280 N. 25th St. • MILWAUKEE 3, WIS.

A description of the SEAMAN MIXER and the work it does is detailed in this recent BULLETIN. A postcard request will bring it to you — rush. Just ask for Bulletin TPS.



**PICTURE
OF THE
MONTH**
CONSTRUCTION
METHODS AND EQUIPMENT



By Land, Sea and Air

BETHLEHEM STEEL COMPANY used the elements of land, sea and air to spot these two giant 167-ton girders into place 120 ft above the water on the new High Level Bridge across the Buffalo Ship Canal at Buffalo, N. Y. The girders were shipped by rail in three pieces from Bethlehem at Rankin, Pa. They were then unloaded and assembled on a barge and riveted. At daybreak the barge was moved into position, and the 208-ft girders were lifted into place one at a time by two American

Traveler 115-ton capacity derricks with 53-ft masts. Once the girders were in place, they were connected at each end by a steel pin 13 in. in dia to a 70-ft cantilever arm protruding from the superstructure. An erection frame at each end steadied the girders 30 ft from the pins until the tons of floor beams, stringers and bracing could be erected. The bridge is being constructed by the New York State Department of Public Works with Bates & Rogers Construction Corp. as prime contractors.

BAY CITY handles one of the world's heaviest ores for GENERAL REFRACTORIES CO.



This BAY CITY Model 45 is unloading and stockpiling heavy chrome ore at a railroad siding for General Refractories Co.



The chrome ore known as chromite or chromic iron, used by General Refractories Company of Curtis Bay, Maryland, in the manufacture of fire brick for steel furnaces, comes from mines in remote sections of the Philippine Islands. Weighing approximately 220 lbs. per cubic foot, it is almost as heavy as lead ore. Yet a BAY CITY Model 45 Crane handles this ore, one of the world's heaviest, with relative ease. This powerful, efficient machine, operating with an Owens "M" bucket, unloads and stockpiles chromite for General Refractories Company at an exceedingly fast rate.

BAY CITY Cranes are ruggedly built for high daily production and long, dependable service on difficult materials handling operations. They have a powerful Diesel engine, one piece cast alloy steel bases, long, wide crawlers, tandem drums in ball bearings, power booster clutches, helical cut gears and many other advanced design features that help insure time-saving, money-saving operation. Every BAY CITY is engineered for accurate balance, easy operation and low cost maintenance. For complete details, consult your nearest BAY CITY dealer.

BAY CITY

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN 247

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHIELDS

Write for any of these catalogs describing BAY CITY Crawlers of $\frac{1}{2}$ yards and up or BAY CITY CraneMobiles and CraneWagons in capacities to 25 tons.

Actual road experience proves . . .

NYLON CORD TRUCK TIRES GIVE

DUPONT and leading tire manufacturers, after working and testing for ten years, developed nylon cords for truck tires. Actual road experience proves nylon to be the best protection yet against tire failure. From all over the country truckers are reporting that nylon cords give more mileage, more recaps and fewer road delays. Records show nylon cords mean lower cost per tire mile.

Nylon has greater tensile strength, flex and abrasion resistance than any other cord used in tires. Nylon cords absorb road shock and give better protection against bruise damage; moisture seeping through cuts doesn't adversely affect nylon. Nylon cords take hottest road temperatures in stride, and they run cooler.

Prove to yourself that nylon cord truck tires give substantially lower cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes nylon fibers, does not produce tires.)



REG. U.S. PAT. OFF

BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

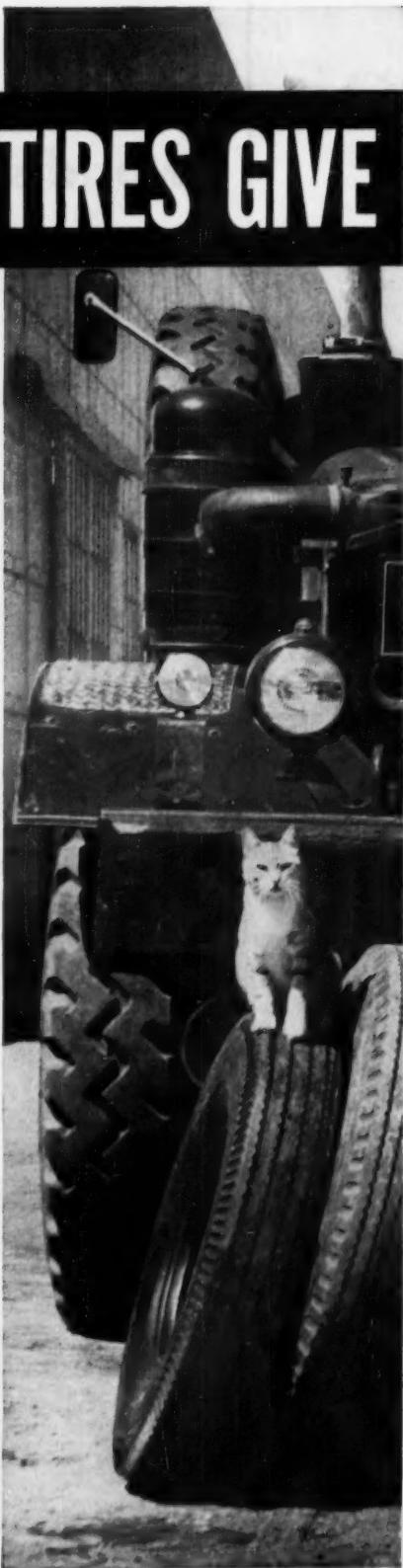
You'll find nylon in passenger-car tires, too! Shock-absorbing nylon cords mean extra protection against blowouts . . . greater safety on any road.



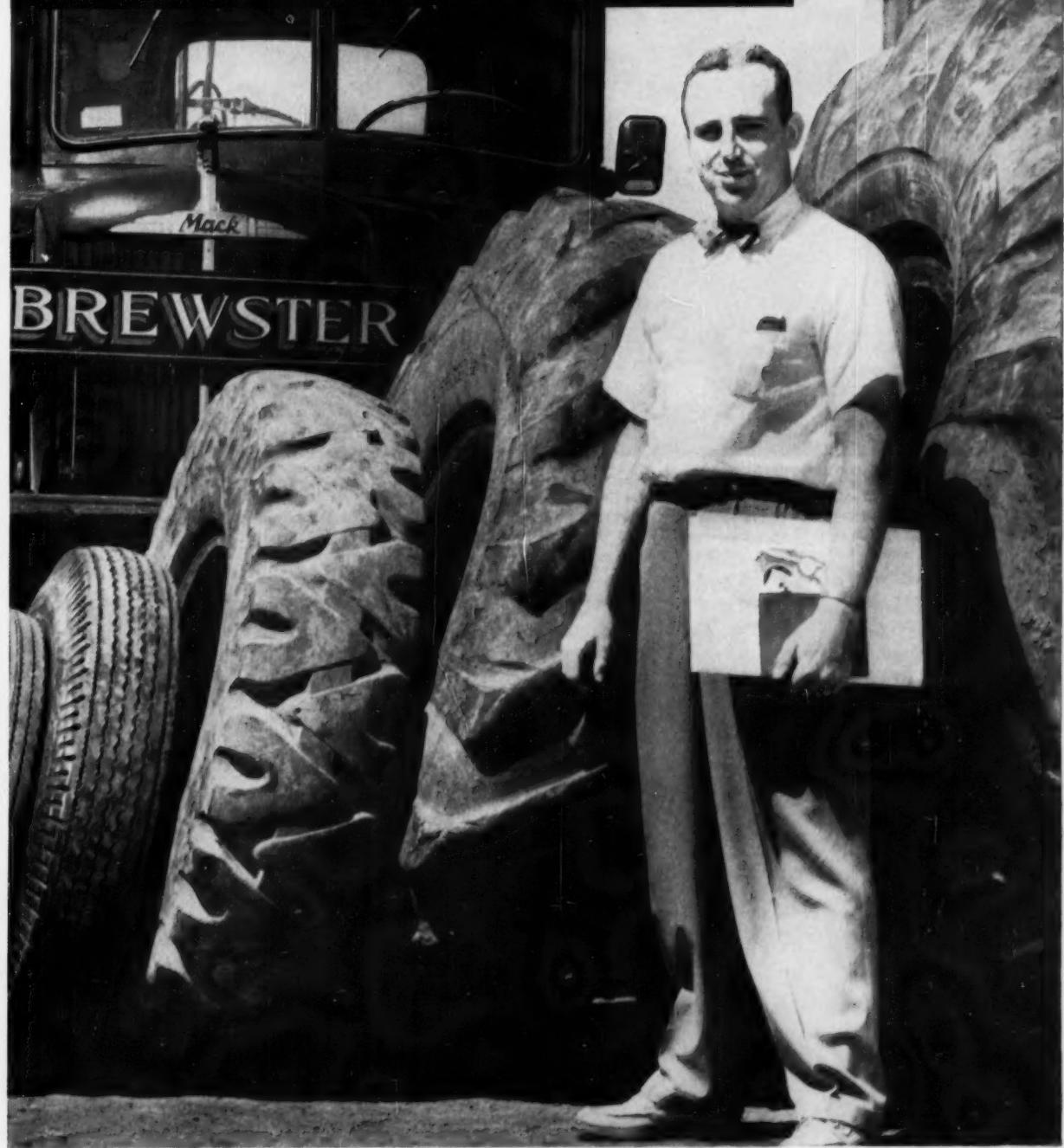
MORE MILEAGE. "On these rugged roads," reports Wm. P. Fuller, Hillyer Deutsch Edwards Lumber Co., Moreauville, La., "nylon cords are the only tires we can get that can do our job."



FEWER ROAD DELAYS. "Nylon cords have cut our road delays 60%," reports Lenn Binn of the Boss Linco Lines, Buffalo, N. Y. "In over 20 million miles of service, not one nylon has blown out."



LOWER COST PER MILE



"ON ALL TYPES OF EQUIPMENT, our experience proves nylon cords cut tire costs from 25% (on-the-road equip-

ment) to 30% (off-the-road equipment)," says Henry D. MacArty of Geo. M. Brewster & Son, Inc., General Contractors

of Bogota, N. J. "We're switching exclusively to nylon cords on more than 110 pieces of equipment."

Construction News in Pictures



ENCLOSING COLOR TV — P&H truck crane sets in another precast concrete wall panel for 46-ft wall as Austin Company erects a new color TV studio in Burbank, Calif., for National Broadcasting Co. Panels are 20 ft wide, weigh from 20 to 35 tons each. Note swing scaffolds for men, hung on steel columns.



BIG CABLE SCRAPER — Sauerman cableway excavating unit working on the West Coast shuttles a 12-yd Crescent scraper bucket from gravel bank to hopper. Head tower at bottom is 90 ft high, moves on rails. Tail tower, 50 ft high, travels on 240-ft bank. Setup delivers 450 yd per hr on 300-ft haul.



START OF OCEAN TRIP — Native helpers stand in surf off West Africa as pulling begins on weighted 12-in. submarine pipeline, to unload tankers anchored 2½ mi offshore direct-

ly into tank farm of Socony Vacuum Oil Co., Ltd., at Accra. Towing of the long semi-floated line was by two tugs pulling on a 9-in. manila hawser. Collins Construction Co., of Texas, did the job.

HOW TO BUY CONVEYOR BELTS

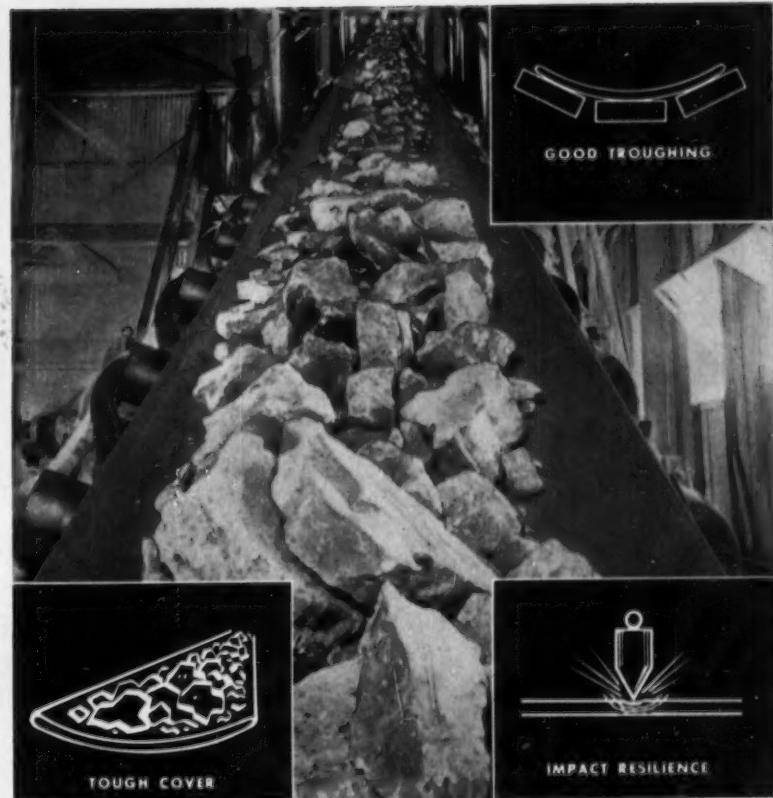
FOR LARGE LUMPS, ABRASIVE LOADS

and get "More Use per Dollar"

Select a belt that assures both maximum flexibility *and* loading impact resistance. One that has high draw-bar strength plus the ability to hold fasteners, and a cover that truly protects and prolongs belt life.

Heavy conventional duck belt constructions fail to provide the needed flexibility and resiliency to absorb heavy loads. They are stiff and "boardy", hard to train on the idlers. Look for a conveyor belt with strength members specially woven to trough easily and cushioned to withstand shock loading. Make certain the belt is moisture and mildew-proof, with protective outer plies and sufficient cover thickness to resist wear and prolong belt life.

Specify by name, the one conveyor belt that offers all these features . . . Ray-Man "F" Conveyor Belt.



RAY-MAN "F" CONVEYOR BELT

This Manhattan conveyor belt combines elastic cushioned inner plies in an outer envelope of strong, yet flexible, synthetic fabric . . . to withstand large, abrasive lumps . . . to permit easy troughability, even where only a thick, narrow belt is used. Special synthetic outer-plies provide maximum elasticity for rounding small pulleys in confined areas. Ray-Man "F" is mildew-proof and, like all Manhattan heavy duty conveyor belts, its service

life is greatly prolonged by R/M's exclusive "XDC" Cover which protects it against abrasion, cuts and tears. For unusually abusive shock loading problems you may find extra-cushioned Homocord your best conveyor belt buy . . . or Ray-Man Tension-Master for extra long lifts.

Let an R/M representative help you select the best conveyor belt to meet your job requirement . . . you'll get "More Use per Dollar".

RH-202-A8



MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY
RAYBESTOS-MANHATTAN, INC.



Flat Belts



V-Belts



Conveyor Belts



Hose



Roll Covering



Tank Lining



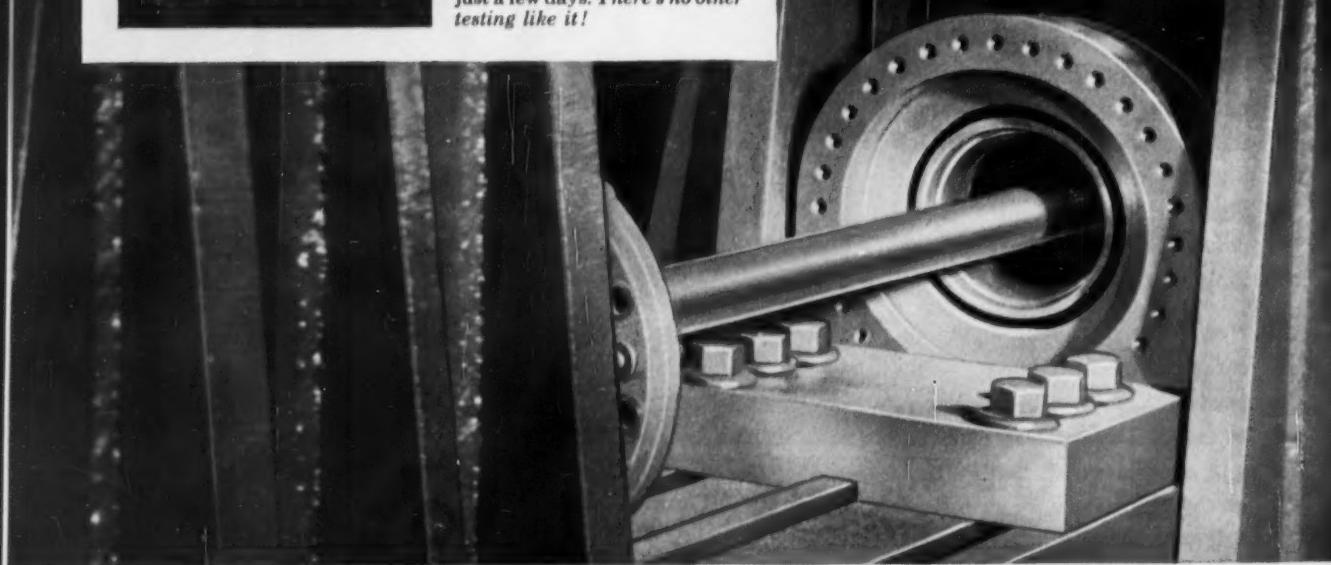
Abrasive Wheels

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Paddings
Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls



In this "Torture Chamber"
TDA proves axle quality!

A stock axle shaft is given a "twist test," 14° backwards and forwards 36 times a minute, 24 hours a day, days on end. An axle gets a simulated "chuck hole" shock every 4 seconds, 24 hours a day for months! Or a "bend test" on an axle housing for 1,000,000 cycles. We even simulate 500,000 miles of the toughest driving situations in just a few days. There's no other testing like it!



WE TWIST AN AXLE SHAFT

*in the famous, one-and-only
indoor proving ground!*



We batter, smash, twist, jerk and overload axles! Equal the worst possible operating conditions. Then throw in some brutal tricks of our own!

Nowhere else does such murderous torture show you how an axle is built to stand up on the job!

Here in the Timken-Detroit "Torture Chamber" we've condensed a multi-thousand-acre proving ground into one room. Here, our engineers can put over 50 years of experience to work for you — unsurpassed experience, obtained in building axles for all types of trucks,

buses, trailers, farm machinery. Here, we can give stock axles and gearing "the works" *indoors*, to any *outdoor* operating condition — under scientific control and analysis.

And it *pays off for you* in longer axle life, less maintenance, repairs and downtime; lower operating costs. Explains why TDA axles are the choice of leading manufacturers and operators.

Meet our "Torture Tester"! With graphs showing speed and torque performance under any operating conditions he chooses—with special dials, recorders and electronic devices—he actually *drives* axles with scientific accuracy from his chair!



THREE TYPES: Hypoid-helical double-reduction, optional inter-axle differential. Worm drive, without inter-axle differential.



for six-wheeler operation ...

THE TDA TANDEM DRIVE REAR AXLE UNIT

Now—the world's finest tandem drive rear axle unit for heavy-duty motor trucks!

And with these features, developed, introduced and pioneered by TDA: (1) Available in 3 types of final drives and 3 capacities. (2) Top-mounted straight-line final drive eliminates propeller shaft angularity. (3) Optional inter-axle differential . . . spur gear design, cab-controlled power-lockout. (4) Torsion flow axle shafts . . . guaranteed for 100,000 miles or three years, whichever occurs first. (5) Hot forged steel axle housing . . . guaranteed for the life of the vehicle. (6) Unit-mounted "P" series power brakes . . . for

longer life, greater economy and efficiency. (7) Cradle ride spring suspension and paralleled torque rod system . . . maintain correct alignment and weight distribution regardless of driving and braking conditions. (8) Exclusive two-piece trunnion tube bracket speeds servicing. (9) Removable torque rod and spring guide brackets . . . for positive alignment, easier replacement. (10) Rubber torque rod bushings and rubber spring seat bushings . . . eliminate metal-to-metal contact. Requires no lubrication.

362,880 TIMES A WEEK

Timken-Detroit

TIMKEN
Detroit
AXLES

TIMKEN DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

Accepted  Standard
TRADE MARK CO. REGISTERED

"TORTURE-TESTED"

to Save Money on the Job

World's Largest Manufacturers of Axles for
Trucks, Buses and Trailers

Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica,
New York • Ashtabula, Kenton and Newark, Ohio
New Castle, Pennsylvania

New TDA brake shoes save
up to 40 lbs. per axle

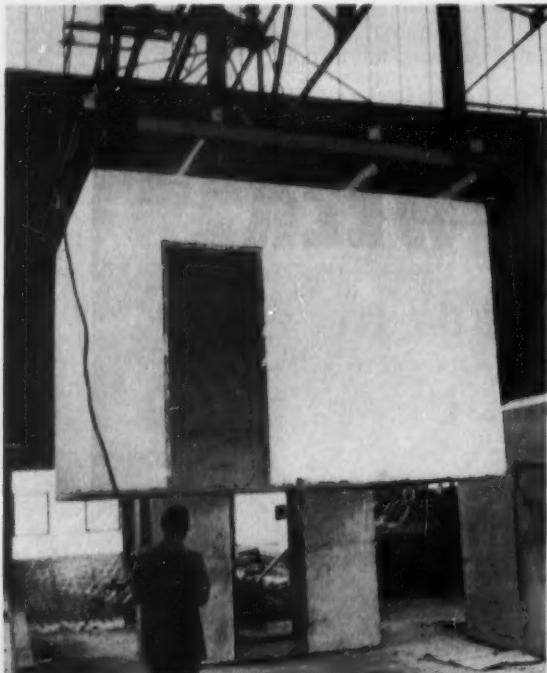
• Lightweight, pressed steel construction to give you more payload plus long wear and safety. Exclusive $\frac{3}{4}$ " TDA "Econoliner" brake liners held rigidly by 12 deep set rivets per block—not bolts. Liners are thickest at center where greatest wear occurs—taper down at ends. Result—longer wear, greater stopping ability. New cam roller mountings never seize or brinell. Light nylon camshaft bearings wear up to 4 times as long!



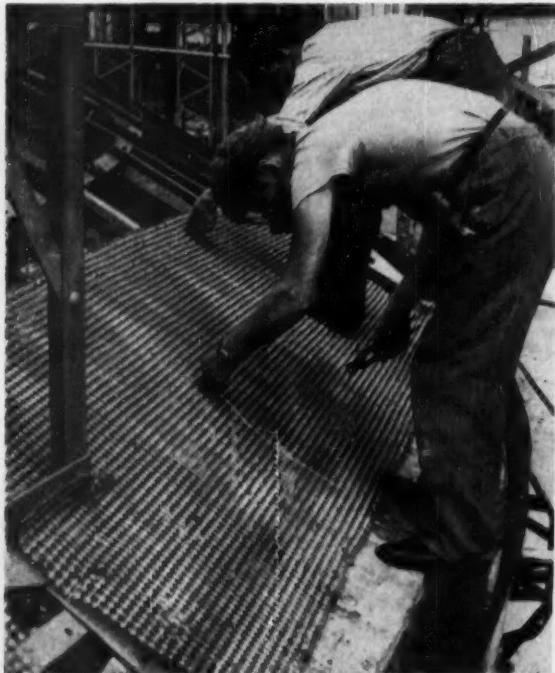
CONSTRUCTION 'ROUND THE WORLD



TRAVELING FORM—The British recently installed beach protection against crashing seas, in the form of concrete "steps" with an upper wall to throw back the waves. Contractor John Laing's men are winching a curved form into position.



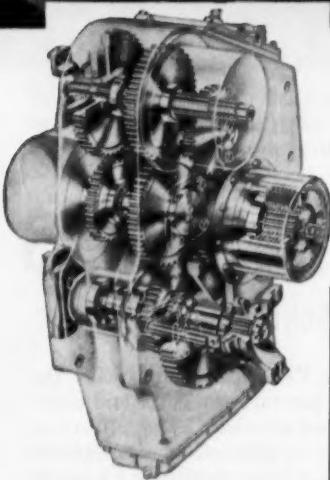
MODULAR UNITS—Down Melbourne, Australia, way Aychar Pty. Ltd., is casting entire rooms at one time, including the ceiling. A reinforced plaster is used, even for load-bearing walls, in a factory-type operation. Units come in several sizes, and careful planning results in varying home designs and larger groups for commercial buildings.—Eastern Publishers photo.



FLEXIBILITY—Shown at the British Industries Fair exhibits was this new lathing material. It is copper wire mesh with clay crosses kilned electrically over the wire intersections. It can be stretched across steel, can replace wooden lath on walls and, being flexible, can be shaped to fit structures like domes, as applied here.—British Information Services photo.



Driver's left hand rests on power-shift levers—there's no clutch pedal



Here's the secret of
BIG TIME-SAVINGS:

The MICHIGAN Power-Shift Transmission. Forward-Reverse and High-Low gears are in constant mesh. Shifting is accomplished by hydraulic pressure. The power-shift levers on the steering column actuate control valves in the transmission. These valves direct oil pressure to the multiple disc-clutches, transmit engine power from the selected drive gears to the output shafts. Hydraulic oil completely lubricates all drive gears and bearings as it flows from top to bottom and returns to the sump through a fine-mesh screen.

You'll cut your loading time! with the **MICHIGAN** **Power-Shift Transmission**

Operating a MICHIGAN Tractor Shovel is both fast and easy. Gone is the old-fashioned heavy duty foot clutch, gone is the tiresome work of clutching every time you shift gears.

The MICHIGAN Power-Shift Transmission does all the work for you. All you do is operate the fingertip hand levers on the steering column . . . one for Forward-Reverse, the other for High-Low speed. Make either shift while moving in either

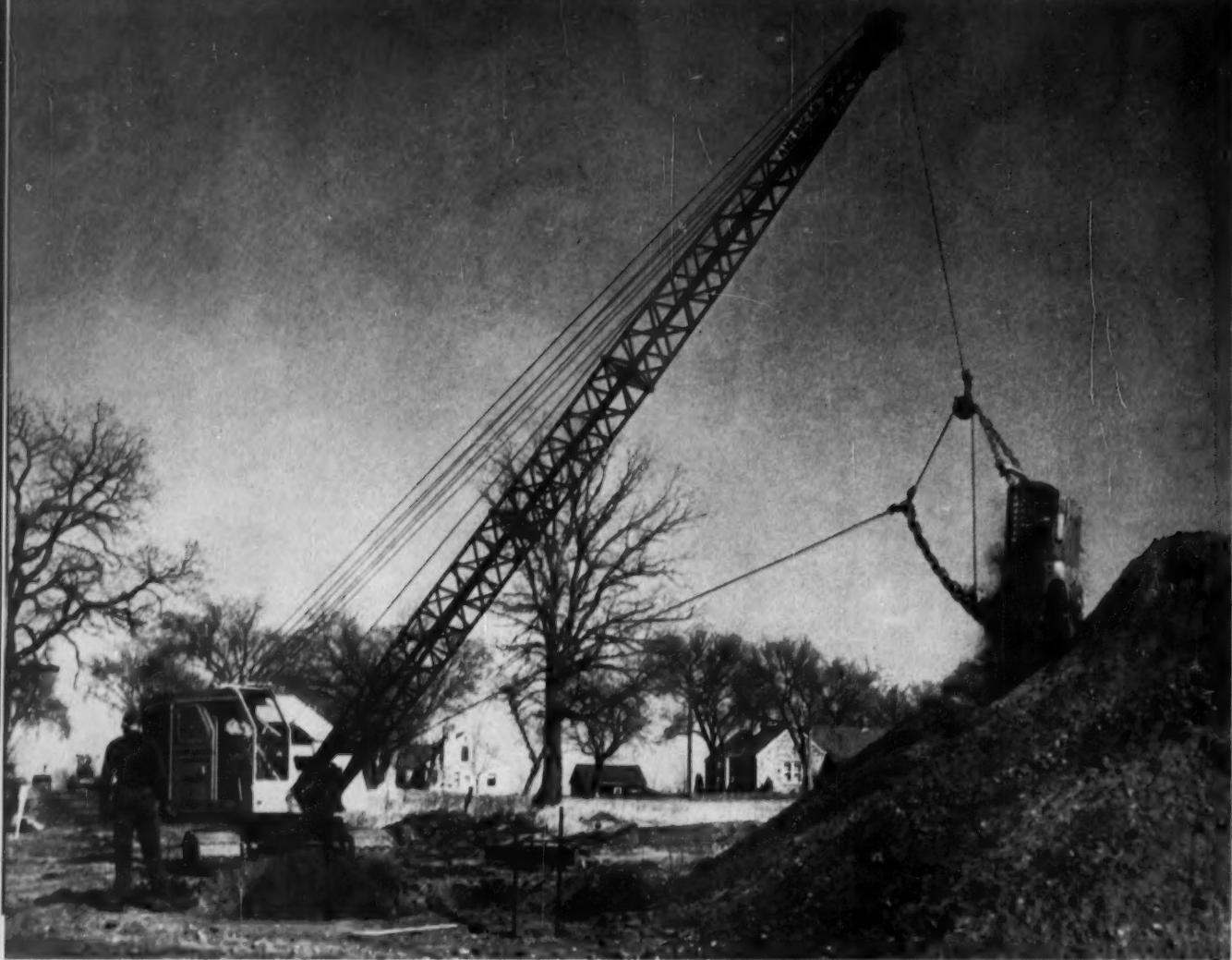
direction without coming to a stop.

The MICHIGAN'S power-shift transmission speeds up operation, cuts loading time, gets you **TOP YARDAGE** per day.

Get a demonstration right on your own job. It is easily arranged: just phone your MICHIGAN distributor. Did you know MICHIGAN Tractor Shovels are available under the Clark Leasing Plan? We would be glad to send you full details.

CLARK
EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
380 Second St., Benton Harbor 25, Michigan



SWINGING A BIG HENDRIX BUCKET on a 50-foot boom, the Lametti Company's American 300 Series Crawler Crane swiftly and efficiently digs a sewer trench for the

proposed \$15,000,000 Southdale Center shopping district in a Minneapolis suburb. This is one of the many large projects on which Lametti is working in this area.

DIGS 600-FOOT TRENCH IN 8½ HOURS

American Dragline Helps Keep Sewer Jobs on Schedule

The Peter Lametti Construction Company of St. Paul, Minnesota, is enthusiastic about the power and efficiency of its new American 300 Series Crawler Crane. On sewer jobs, its new American Dragline has dug 600 feet of trench, averaging 8 to 10 feet in depth in about 8½ working hours. In the rapidly-expanding

suburban areas of St. Paul and Minneapolis, the Lametti Company has several large sewer and water main jobs going simultaneously. The American Crawler Crane's ability to give maximum performance day in and day out helps further the Lametti Company's reputation for "on schedule" production.



"A POWERHOUSE" says Harry H. Petersen, Lametti Company Vice President, of the firm's new American 300 Series Crane. "On recent projects," Petersen stated, "our American machine has showed unusual power on the heaviest of work."

(Advertisement)



"AMERICAN GETS MORE DONE because it takes less effort to operate," says crane operator Earl M. Evans. After a hard 10-hour shift on the American, Evans says he feels less tired than with any other rig. Anti-friction bearings in the American's brake linkage reduce leg effort over 60%, minimizing operator fatigue and increasing production.



SETTING RECORDS SINCE 1878—World-famous American Revolver Cranes have been the standard of performance on the world's biggest and toughest jobs for 77 years. That same wealth of engineering experience and know-how is found in American Crawler and Truck Cranes. That's why hour for hour, load for load, American Cranes outproduce all others in the field.

WHERE QUALITY BEGINS—The American home, 23 acres under roof, sprawls along the banks of the Mississippi River at St. Paul, Minnesota. With its own foundry, forge, machine and structural shops, American completely controls manufacture from the molten metals to the finished product. American owners are assured of service and genuine replacement parts for the life of their machines. For factual, helpful information on American Crawler or Truck Cranes, see your American Distributor or write American Hoist & Derrick Co., St. Paul 1, Minnesota.

(Advertisement)

700-1-10



UNMATCHED ENGINEERING FEATURES on American Crawler Cranes mean they can handle a variety of jobs with ease. Using a 50-foot boom, the Lametti Company's American Crane stops bucket work only momentarily while it lifts a work box out of a sewer trench. Permanently-aligned shafts, gears and assemblies, one-piece electrically welded machinery deck, massive cast steel car body and anti-friction bearings throughout help make American the most rugged, most dependable cranes built.



Carnaghi digs into lubrication problem...comes up with answer



Ray J. Carnaghi (right) discusses lubrication of equipment with Frank Wolan, Standard Oil automotive engineer. Frank has been serving customers for Standard Oil since completing the Standard Automotive Sales Engineering School. He got his engineering training at Michigan State College. Customers have found Frank's experience and training pay off for them.



STANOLUBE HD-M MOTOR OIL

Like every outfit in the business of moving earth, Joseph P. Carnaghi & Sons, Detroit, know what it means to keep equipment on the move. There is no place on the schedule for stuck rings, bearing failures, fouled plugs. Down time due to lubrication failure is something Carnaghi learned how to eliminate 20 years ago. It was then that this contractor began using Standard Oil products.

Now STANOLUBE HD-M Motor Oil is used in Carnaghi trucks, cranes, shovels and dozers. Earth haulers that go away heavy and come back light, give oil a full challenge to deliver trouble-free operation. Wet, dry, heat, cold, and grit are the order of business for dozers, shovels, and cranes. They give motor oil tough, rugged jobs to do.

STANOLUBE HD-M stands up to the jobs Carnaghi gives it with a wide margin to spare. It is designed to do just that. Carnaghi equipment maintenance men have found this out from inspection of equipment at overhaul time. Their skilled maintenance, teamed with STANOLUBE HD-M, result in:

1. Pistons free of varnish
2. Less cylinder and ring wear in high temperature service
3. Valve stem deposits and valve burning virtually eliminated
4. Engines unaffected by unstable fuels
5. Less spark plug fouling
6. In low temperature service, less sludge

This sound like the kind of operation you would like for your equipment? A Standard Oil automotive engineer will be happy to tell you how, with STANOLUBE HD-M, you can get it. In the midwest, a call to your nearby Standard Oil office will bring prompt response. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



STANDARD OIL COMPANY (Indiana)

Contractor Joseph P. Carnaghi & Sons dig foundation for new building. STANOLUBE HD-M Motor Oil is used in all Carnaghi equipment.

JANUARY, 1955

VOLUME 37

NUMBER 1

**CONSTRUCTION
METHODS
AND EQUIPMENT**

HENRY T. PEREZ, Editor

Highways Ahead

THERE SHOULD BE no doubts about the construction industry's ability to handle President Eisenhower's expanded highway program. Contractors are ready to take on more work, equipment manufacturers have the capacity to build more machines and distributors are able to service them, and materials supply can be increased. That this is so is borne out by past performance records and by current surveys.

During the last twelve months—the greatest road-building year ever—nearly \$4 billion was spent on highways. Yet contractor competition was keener, prices were farther below estimates, and numbers of bidders per job were more numerous than they had been in some time. The industry was not only unstrained, but also eager for more highway work.

Surveys conducted by the Associated General Contractors of America, American Road Builders Association and by this magazine (p. 14) show that contractors are able to undertake a goodly increase in highway work immediately. And they can build up their plant and staffs in a relatively short time to meet the demands of any highway building program proposed. But, of course, design plans and right-of-way must be made available in an orderly fashion.

Equipment supply is adequate, too. The Con-

struction Industry Manufacturers' Association states that its members operated at between 33 and 67% of capacity in 1954, so production can be stepped up immediately. Moderate expansion could eliminate any threat of equipment shortage that might develop under a greatly enlarged highway program.

Estimates are that the industry currently has the capacity to manufacture \$2 billion worth of construction equipment annually, not including over-the-road trucks. About \$1 billion a year goes into replacements, leaving a like amount for expansion of equipment spreads or creation of new ones.

At the distributor level, there will be no problems. The Associated Equipment Distributors says its members are well able to keep contractors supplied with parts and service under any size road-building program.

The outlook for an adequate supply of construction materials, too, is bright. Presently announced expansion of capacity in cement and structural steel will ease the pinch that might develop there.

What it will take to enlarge current equipment fleets to handle an extra \$1-billion worth of highways, and where the money goes, is shown in the tables below. Multiply these by the amount of increase in the highway program and you will see the size of the undertaking in prospect.

What Additional It Takes to Build an Extra \$1 Billion Worth of Roads

MONEY . . .	Millions	Haul Units	Number of Units	Miscellaneous Units	3,145
Materials and Supplies	\$373	Scrapers	2,400	Totals	36,000
Contractors' on-site labor	271	Trailers & Wagons	1,090		
Contractors' equipment	184	Trucks (Off-Highway)	475		
Misc, overhead and profit	172	Dump Bodies & Hoists	2,000		
Total	\$1000	Loaders, Front End	1,000		
NOTE: An additional \$250 million will be spent on right-of-way and engineering.		Mixers			
		Soil Stab. & Bitum	200		
EQUIPMENT . . .	Number of Units	Motor Graders	1,500		
Asphalt Plants	250	Power Cranes & Shovels	2,925		
Bituminous Distributors	250	Pumps, Portable	2,340		
Bituminous Pavers: Spreaders & Finishers	375	Rollers			
Compressors		Road Tamping, Pneumatic	1,925		
Portable Air	2250	Tractors			
Concrete		Crawler	3,000		
Batching Plants	100	Wheel-Type	2,000		
Mixers, Portable	1,500	Tractor Attachments			
Spreaders	100	Cranes & Loader	200		
Finishers	100	Dozers, Bull & Angle	1,500		
Pavers	200	Power Control Units	3,700		
Truck Mixers & Agitator	1,000	Trenchers & Ditchers	250		
Crushing & Screening Plants	225				

* In addition to present inventory.

NOTE: Does not include over-the-road type of trucks or vehicles, of which 20,000 more would be needed.

MATERIALS . . .	Unit	(000's)
Cement	bbl.	11,600
Aggregates	cu. yd.	75,400
Bitumens	gal.	290,000
Lumber	mbm.	98
Wood piles	f.t.	3,200
Reinforcing steel	tons	183
Structural steel (total)	tons	201
Metal culverts	tons	38
Concrete culvert and drain pipe (all sizes)	f.t.	5,200
Clay pipe and tile (all sizes)	f.t.	2,020
Petroleum products	gal.	170,000
Explosives	lb.	23,200

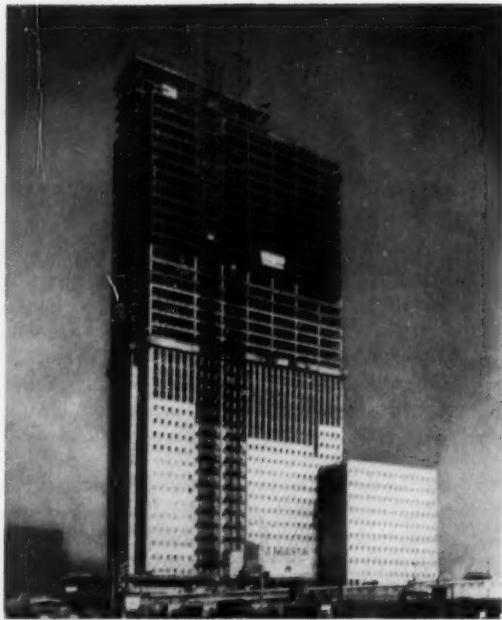
Based on surveys by Bureau of Public Roads, Construction Industry Manufacturers Assn. and American Road Builders Assn.

Small Details Speed Big Job

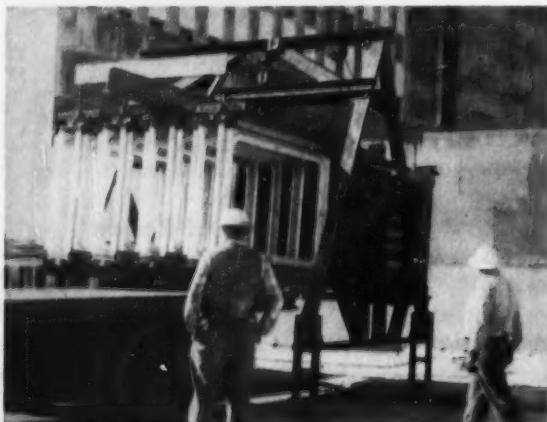
TALLEST SKYSCRAPER IN CHICAGO, and the first built there in 20 yr., is the 41-story Mid-America Home Office of the Prudential Insurance Co. of America. While building styles have changed in that time, building techniques have changed even more. And General Contractor George A. Fuller Co. and its various subs are taking every advantage of new time- and labor-saving methods to rush the big job to completion.

Some of Fuller's smart building practices are shown in the accompanying photos. But there are many more. For example, movies of other similar building operations are shown to teach workmen unfamiliar details. Outside hoists let permanent elevator work start sooner. Powered carts deliver back-up brick and mortar. Rolling scaffolds serve ceiling and mechanical crews. Separate concrete form crews work six floors apart to speed the work without interference. Metal-deck flooring goes in with structural steel erection, followed closely by pouring of concrete floor fill and topping to make a clean working platform for subsequent operations. And so it goes, through all phases of the work.

Running the well-planned job for Fuller is Project Manager Roy W. Booth, with Joe Kropacek as superintendent and Charles E. Frasenius as mechanical supervisor. John Landwehr is Prudential's project coordinator, and Wm. Burdick is project engineer for Naess & Murphy, architect-engineer.



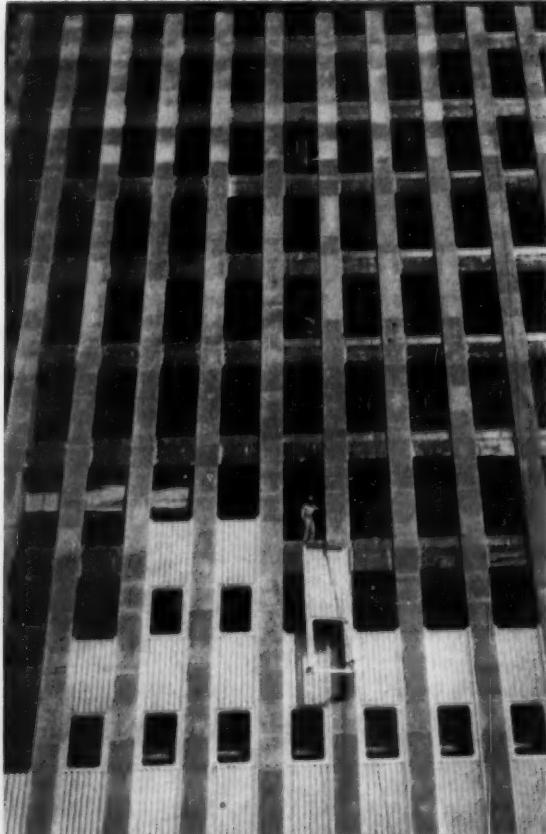
Aluminum Spandrels...



SECTIONS ARE UNLOADED, four pairs at a time, by a rolling gantry powered by hand crab. Delivery truck backs beneath gantry, spandrels are raised, truck pulls away, and gantry lowers load.



PANELS ARE SCOURED with steam from Kerrick cleaner before they are moved on timber dollies to building for erection. Spandrel units measure approximately 6x13 ft, weigh between 600 and 700 lb.

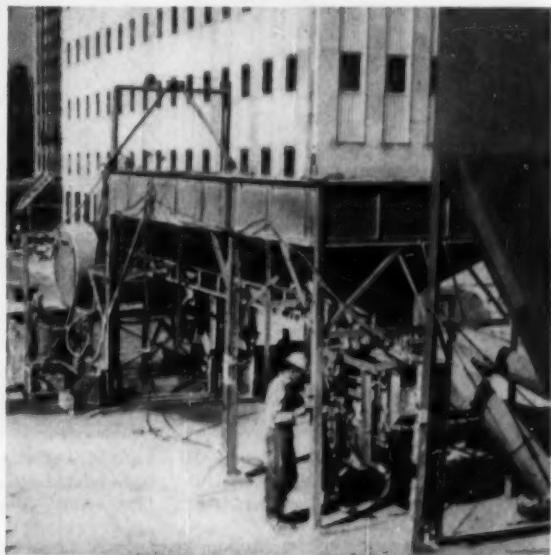


UNIT IS RAISED into place between strips of Indiana limestone by hoist five floors above. It will be fitted later with double-glazed aluminum-frame windows that are sealed by inflated gasket.

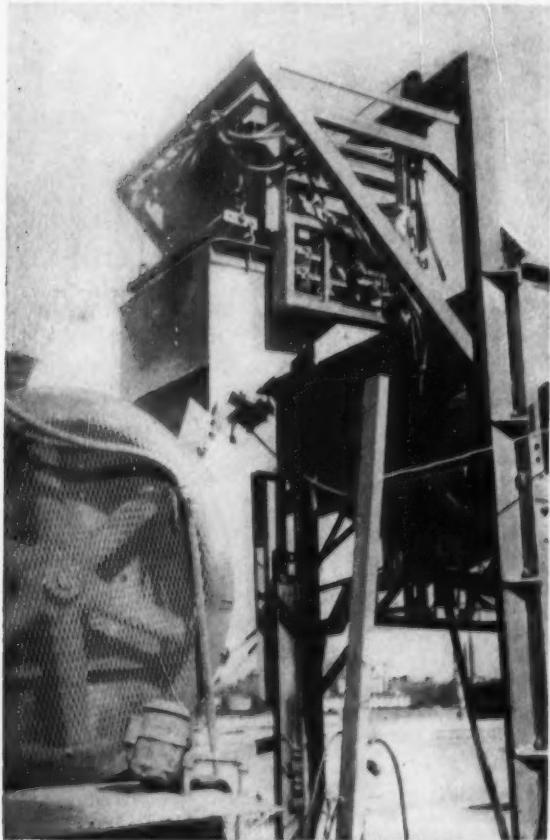


SPANDREL HOIST IS POWERED by Black & Decker and VanDorn 1½-in. electric drills. Boom and mast, which rests against building frame, are aluminum. Unit is caster-mounted for easy moving.

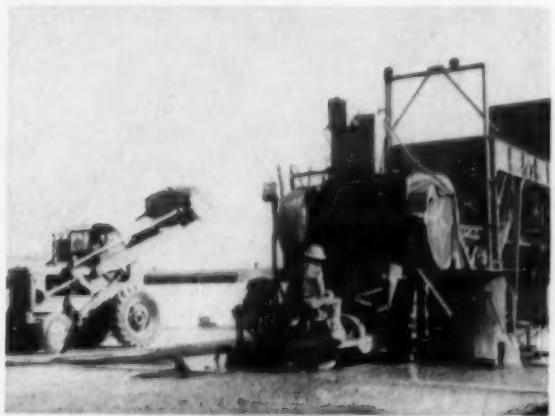
Concrete Floor Fill...



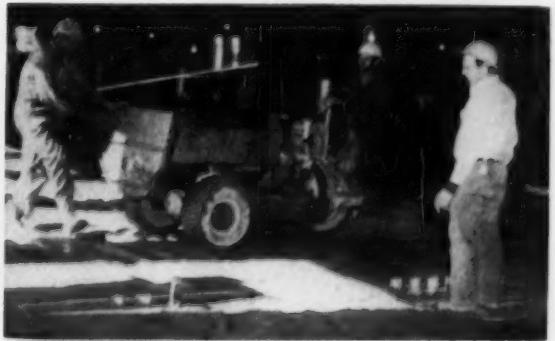
MATERIAL IS BATCHED AND MIXED in special plant at site for close quality control. Contractor-built plant incorporates 240-bbl cement and 120-bbl fly-ash silos both with screw unloaders.



WEIGH-BOX IS LIFTED by cables to hydraulic ram to discharge into 1-yd paddle-type mixer. Box also is fitted with hydraulic traction motors that propel it on rails beneath bins for filling.



CONCRETE IS DISCHARGED into 1-yd Scootcrete for delivery to building hoist as ½-yd Tracto-Loader recharges plant's three 6½-yd aggregate bins. Weigh-batcher is a modified Winslow unit.

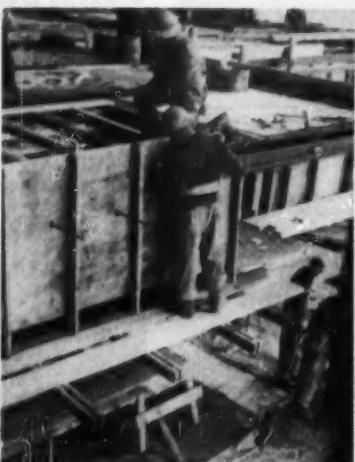


MIX IS DELIVERED on top of Robertson Q-floor by 18-ft Scootcrete. Fill contains 335 lb cement, 50 lb fly ash, 1,700 lb pea gravel, 1,400 lb sand, 2 gal Pozzolith, 5 oz Darez and 35 gal water per yd.

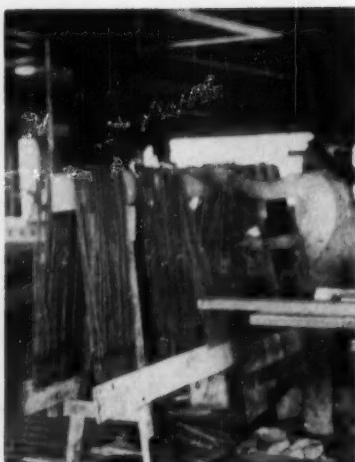
Concrete Fireproofing . . .



FORM BOLTS ARE FIXED to girder by Nelson stud welder that fastens $\frac{1}{2}$ x 7-in studs in a few seconds. Two rows hold forms.



PANELS ARE PLACED for spandrel beam. Note safety belts and lines and how 2x4s of form bottom extend out to make catwalk.



FORM HANGERS ARE STORED on labeled racks so right size Sure-Grip wire units can be obtained easily. Racks reduce wastage.



REINFORCING MESH IS BENT in hydraulic press brake. After bending, lengths of 2x2/12x12 galvanized mesh will be fitted around girder to reinforce 6 $\frac{1}{2}$ -bag, 3,000-lb concrete that fireproofs steel.



FORM MATERIAL IS HOISTED from floor to floor for re-use by Thomas electric niggerhead clamped to beam. Forms generally are $\frac{3}{4}$ -in. plywood panels backed by 2x4 studs and double 2x6 wales.

Sprayed Ceiling . . .



PLASTER IS MIXED in mortar machine and dumped into electrically driven pump that forces it through rubber hose to nozzleman.



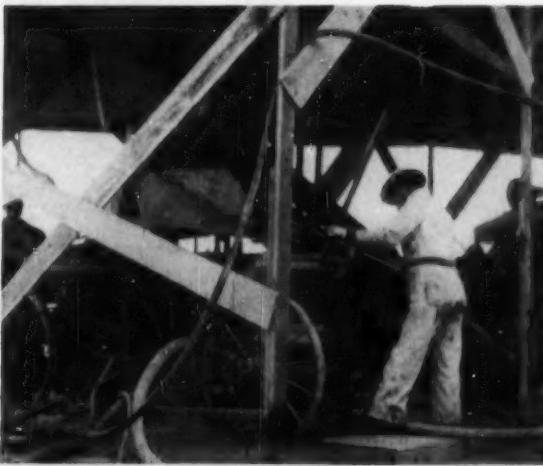
MIX IS GUNNED on to metal lath suspended below cellular steel Q-flooring in office areas of building. Nozzleman controls spray by adjusting air supply, also has remote control of mortar pump. Plaster, made with lightweight Zonolite aggregate, is good fire-proofing.

Stone Facing...

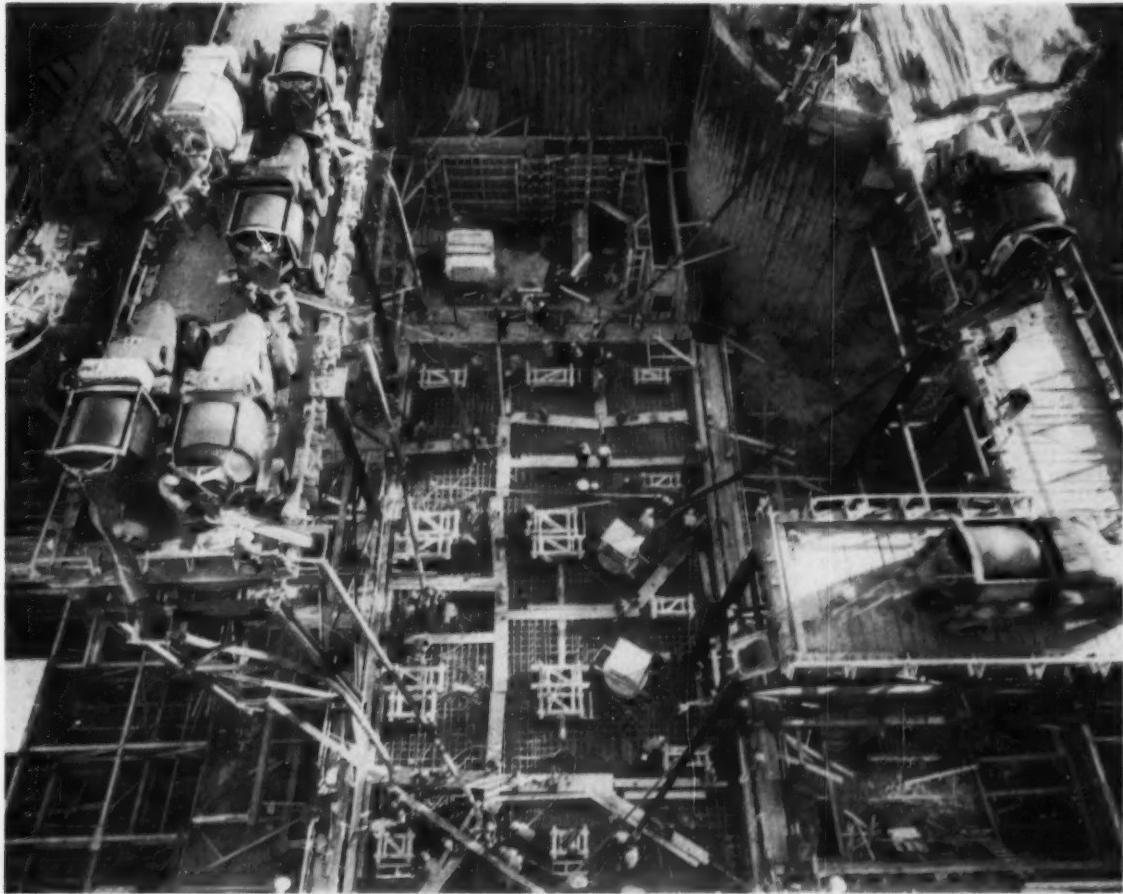


STONE PANELS ARE HANDLED by Sasgen hand hoist mounted on rear of saw-horse arrangement two floors above point of placement. Stone mason communicates with hoist man by bell signal system.

Gunite Work...



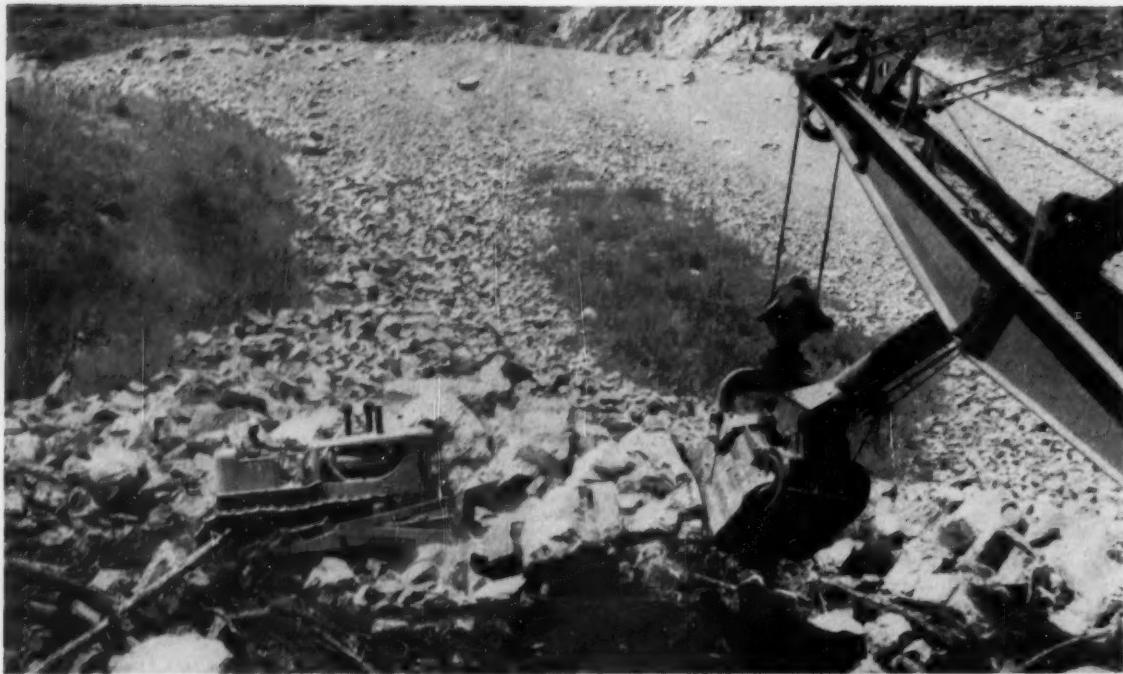
GUNITE IS SUPPLIED by two machines fed by single Jaeger 11-S mixer. Batch is 2 bags cement, 4 sand, 18 lb Embaco. Gyro-Flo 600 supplies air to drive machines, conveyor and shaker screen.



SEVEN TUBES PLACE CONCRETE 50 ft below grade at the Frank R. Phillips power station of Duquesne Light Co. near Pittsburgh. Temporary trestles support transit-mix trucks dumping into 8-in. hoses with extra heavy inner tubes of rubber, through 3-ft-square

hoppers. The 15,000-yd foundation was placed in 13 pours of 12 ft each. Hose sections were removed progressively from the bottom during pouring, and no segregation took place. The Dravo Corporation, contractor, beat the construction schedule by four weeks.

Big Rocks of Stone Slide Help Divert



1. BIG DIPPER of Manitowoc shovel reaches out to pick up large boulders rolled within range by hardworking Allis-Chalmers HD-20 working the rockpile. This heavy fill material was gathered and stockpiled at strategic spots for later fast dumping into the

swift-flowing Snake River, to divert the water for closure of the giant Palisades Dam—an earthfill project for the Bureau of Reclamation. Handy natural rock slide adjacent to dam site was utilized for fill material in deep water.



3. RIVER PLUG is extended rapidly into the stream as HD-20 with Gar Wood angledozer pushes the heavy stuff in. Trucks and scrapers bring coarse rock and finer consolidating material from stockpiles placed conveniently near. The completed diversion dam

is approximately 100 ft wide across the top, 40 ft high and about 250 ft long. Job was well organized. Diversion from start to finish was completed in 2½ hr and water made to flow to the right behind tractor in middle distance.

Turbulent Snake River at Palisades Dam



2. ONE AT A TIME is the rule when such big ones are handled. Operator of the Model 4500 Speedcrane lays one carefully across the body of a rear-dump Euclid, as the truck driver watches from the ground. Note how free-rotating dipper stick has turned

to accommodate particular angle required for best fitting of load on to truck. Contractors are J. A. Jones Construction Co., Inc., Charlotte, N. C. and Seattle, and Chas. H. Tompkins Co., Washington, D. C.



4. DOWNSTREAM COFFERDAM is started in more quiet water by Manitowoc with 5-yd Esco bucket casting mixture of earth and coarse gravel at an average of 600 yd per hr. Palisades Dam in Idaho, near Wyoming border, said to be the largest earthfill

dam attempted by the Bureau of Reclamation, eventually will contain some 13,000,000 cu yd of fill. Construction so far has been on the left embankment; diversion through tunnels under dam makes complete buildup possible. (More photos on next page)

ROCKS AID DIVERSION . . . Continued



5. GAP NARROWS as dozers effect closure by rolling big boulders into fast water, then fill voids with earth and gravel brought up by trucks and scrapers from stockpiles on both sides of

river. Downstream view shows dam rising in left background, with river flowing around to the right. Fully diverted river will flow to left into tunnels leading under dam embankment.



6. DOWNSTREAM EXCAVATION prepares channel for water soon to be pouring out of diversion tunnel outlets. Dragline is a Manitowoc 4500 swinging a 7-yd Baer bucket and at right is a

Manitowoc 4500 with shovel — both loading into Euclid haul units. Palisades Dam under construction appears in right rear, and Snake River flows along high shoreline at left.



7. BIG BOULDER is rounded up for the loading shovel by an HD-20 Allis-Chalmers crawler equipped with a Gar Wood angle dozer. Rocks weighing up to 40 tons were handled during

the operation that effectively teamed big excavators, tractors and suitable haul units. Palisades Dam is to be 273 ft high, 2,250 ft. wide at the base and 2,200 ft long across the crest.



FOUR-WHEEL DRIVE and courage once were needed for trip between Cochabamba and Santa Cruz, Bolivia.

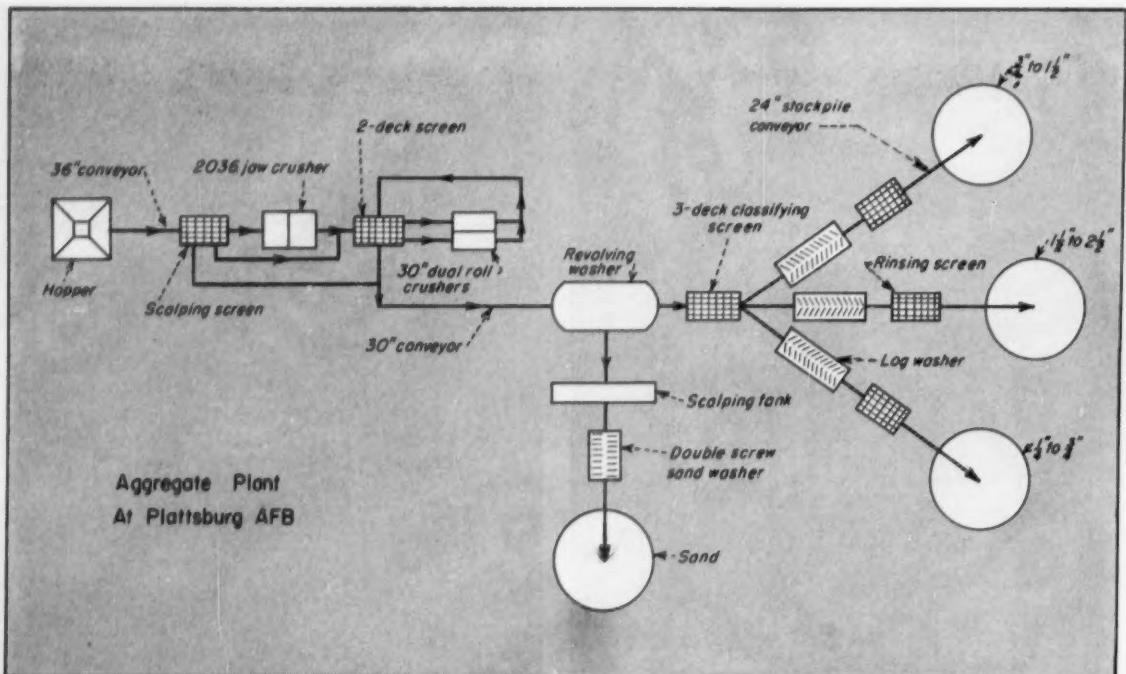


HIGH ALTITUDES, the rain forest and insects conspired against Cat D8's carving new 312-mi right-of-way.

Bolivia Gets \$34-Million "Super" Road



GRAVEL TOP is luxury on new 15-hr run, compared with old trails that took 4 days and more. Highway, paved for 25 mi at each end, leads to rich Amazon lowlands. Macco Panpacific Co. used some 900 machines, moved 14,500,000 yd of dirt.



AGGREGATE PLANT FLOW DIAGRAM shows what it takes to convert unclean pit gravel into high quality, graded sand and stone. After 3-stage crushing, material is washed in revolving drum as

sand is scalped off. Coarse particles are classified into three sizes and sent through log washers to remove undesirable materials. Aggregates are then rinsed on screens and stockpiled.

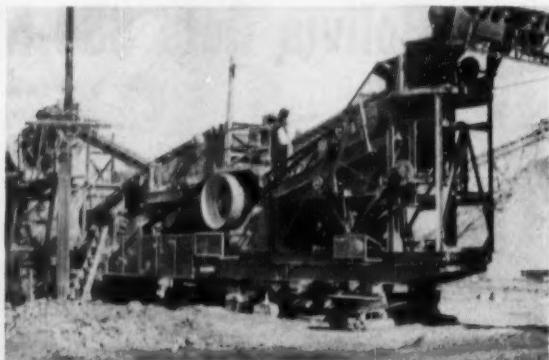
Portable Gravel Plant Supplies Big Paving Job

A PORTABLE CRUSHING and screening plant teamed with three stationary log washers is doing a top-notch job of salvaging good concrete aggregates from an unclean gravel pit. Set up to supply a big paving job at Plattsburg Air Force Base in northern New York, the plant turns out more than 250 tons per hr.

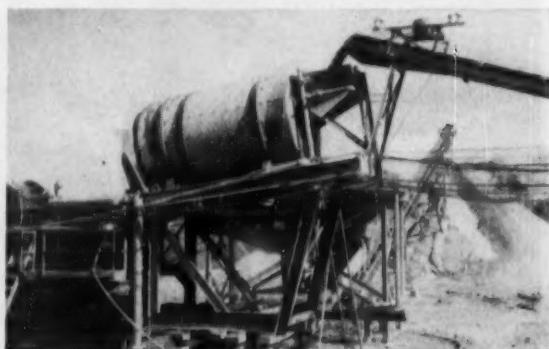
Because of the high percentage of 2½-in. plus material, the pit gravel is first run through a Universal crushing plant. A jaw crusher and a two-stage roll crusher reduce the oversize material and then send it to a washing plant. Here, sand is removed, pumped to a scalping tank, washed, and stockpiled. Coarse aggregates are separated into three sizes and sent through log washers to remove soft particles and organic material. Just beyond the log washers the aggregates are rinsed on a screen and stockpiled.

At the paving site, concrete is laid 14 in. thick in 20-ft strips. The job requires about 400,000 cu yd of concrete for aprons, taxiways, and 1,000-ft end sections on the 200-ft wide runway. Production averages about 1,200 cu yd per 8-hr day.

Joint-venture contractors on the \$9,100,000 job are D. W. Winkelman Co. of Syracuse, N. Y.; J. A. Jones Construction Co. of Charlotte, N. C.; and C. H. Tomkins Co. of Washington, D. C. W. Robinson is project manager for the contractors, and Col. C. Davis is in charge for the Corps of Engineers, U. S. Army.



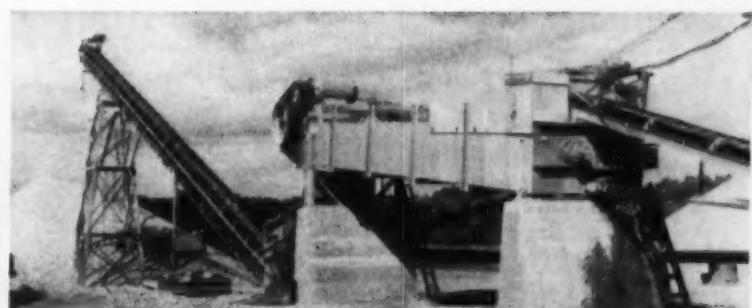
THREE-STAGE CRUSHING PLANT, a portable Universal 293QS, reduces oversize in jaw crusher and dual roll crushers. Finished size pit material is bypassed around crusher at 2-deck scalping screen.



WASHING PLANT removes sand and water and pumps it to water scalping tank. Retained sand is fed into double-screw washer and stockpiled. Coarse material is classified into 3 sizes.

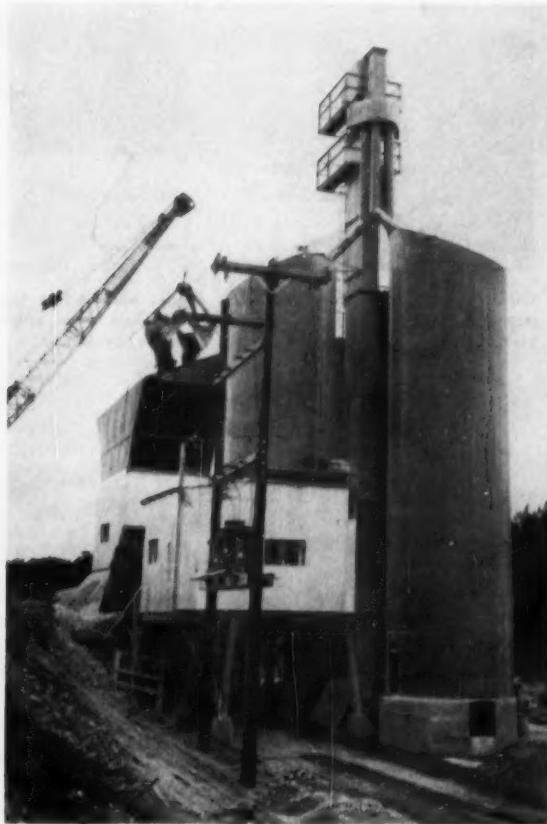


LOG WASHERS set up just beyond washing plant remove soft particles and organic material from each of the three sizes of coarse aggregate.



RINSING SCREENS give aggregates final washing as they are discharged from the log washers. Waste minus $\frac{1}{4}$ -in. stone goes off with slurry. Clean aggregate is stockpiled.

STOCKPILED SAND
is loaded into Ford dump truck with
Haiss bucket loader. Caterpillar No. 6
shovel loads stone trucks.



BATCH PLANT provides two-stop service for trucks, one for aggregates and the other for cement. Aggregates bins are stocked by a Manitowoc clamshell. Silos store 3,000 bbl of cement.

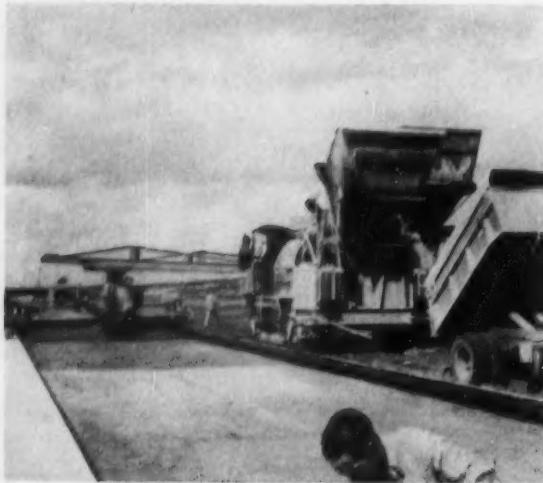


PUSHBUTTON CONTROLS in both sections of Johnson automatic batch plant speed batching, increase weighing accuracy, record readings on special tape, and reduce operator fatigue.

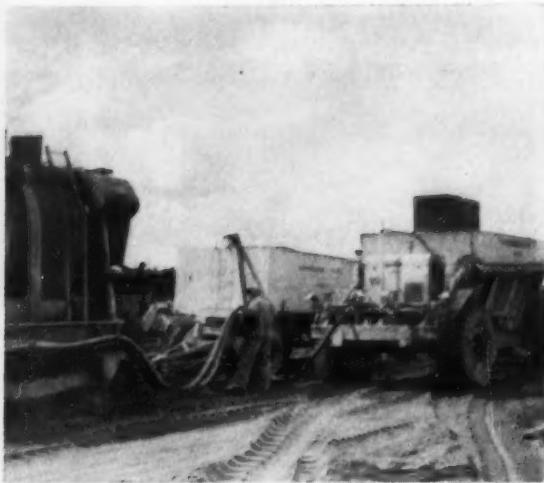


FINEGRADER PULLS ITSELF over Heltzel 14-in. steel forms, as it removes excess material. Finish rolling behind Blaw-Knox machine prepares grade in front of fast-moving paving spread.

PAVING AT PLATTSBURG . . . Continued



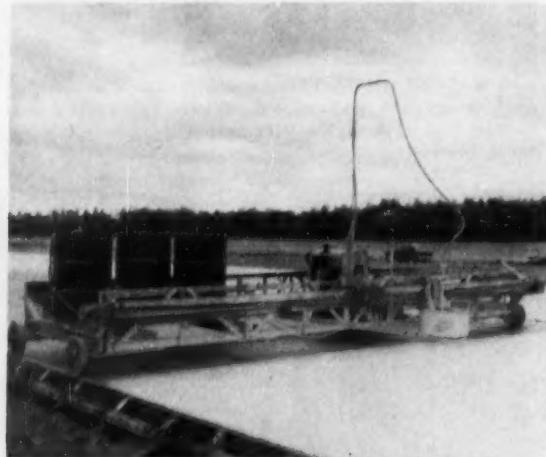
TWO DUAL-DRUM PAVERS, both Koehring Twinbatchers, are charged by a fleet of fourteen 3-batch trucks. Long booms allow pavers to work side by side outside the forms, as they place concrete.



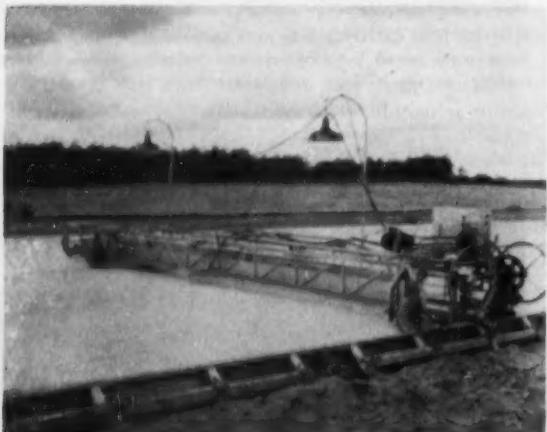
WATER FOR MIXING CONCRETE is pumped to both pavers from tank trailer pulled by outside paver. The tank trailer is filled by a converted Euclid bottom-dump that loads up at a brook.



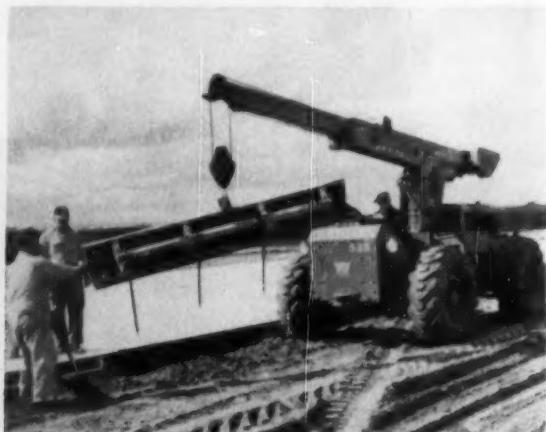
BANK OF SEVEN VIBRATORS powered by an Onan generator extend deep into the concrete. Ferguson machine is pulled by Jaeger spreader. Jaeger finisher and Koehring bull float follow.



CURING MACHINE riding on forms applies white curing compound to surface of freshly laid concrete. Chain drive propels Heltzel machine and also reciprocates spraying mechanism.



JOINT SAWING RIG, developed by Seals, Inc., cuts weakened-plane joints every 20 ft from 8 to 10 hr after the pour. Electric generator mounted on truck powers the motors and lights.



HYDRAULIC CRANE easily strips heavy form and pins with one lift. New Austin-Western rig loads forms on trailer, unloads them at the other end of the job, and also sets them in place.



Total dead load will be only 7 psf on this frame when . . .

Contractor Pours 3-Acre Roof Deck



AFTER BULB T-RAILS had been placed and welded to the joints, formboards were laid and galvanized welded mesh 5 ft wide was used to reinforce the vermiculite concrete.

ONE OF THE LARGEST vermiculite concrete roof decks ever poured—145,000 sq ft—was recently completed by the Vermiculite Placing Co., Atlanta, Ga., for the \$3,500,000 Streitmann Biscuit Co. structure in Macon. The roof consists of a 2-in. slab of 1:4 mix vermiculite concrete over formboard of $\frac{1}{2}$ -in. Gray-Lite laminated to $\frac{1}{2}$ -in. Ins-Lite placed on bulb T-rails. The entire deck is covered with 5-ply, 20-yr bonded built-up roofing. Total dead load of the deck is 7 lb per sq ft.

Zonolite aggregate was used (see p. 74, CM&E Oct. '54). Designers and general contractors were Rust Engineering Co., of Birmingham, Ala., and Pittsburgh, Pa.

The roof work started by placing and welding bulb T-rails to the joists on a 40,000-sq ft section of the deck. This section is broken up

3-ACRE ROOF . . . Continued

by over-ventilators, a wood expansion joint across the center, and eight roof drains.

Formboards were laid by workmen wearing white gloves so that the under side, which formed the ceiling, would not be soiled. The boards have a 1½-in. bevel 1/16 in. deep on the long edges of the Ins-Lite surface so they fit flush on the T-flanges. The boards were precut so that ends met over joists, not over open spans.

To distribute the formboards over the open framework, two four-wheeled carts which ride on the T-rails were used.

As each formboard area was completed, it was covered with 4x8-in. galvanized welded wire reinforcing mesh in rolls 5 ft wide x 200 ft long. The longitudinal wires are No. 12 gage, the cross-wires No. 14. The long dimension was laid at right angles to the T's.

The mesh edges were stapled to the deck and around roof vents. Adjacent strips were fastened along their common edge.

Handy Mixermobile

The vermiculite concrete was mixed in a 50-cu yd per hr capacity Mixermobile located at ground level. The Mixermobile consists of a batching box, rotating drum, and a bucket that travels vertically in a tower, emptying into a hopper on the roof. A tender on the roof hopper operates a gate to regulate the flow of concrete into wheelbarrows.

Screeds of 1-in. iron pipe 24 ft long were laid across the top of the T's, assuring a uniform 2-in. thickness of the concrete.

The deck was poured in strips 12 ft wide, roughly leveled, screeded with wooden straightedge and finished with bull and long-handled wood floats.

The 40,000-sq ft section of the roof pouring required 8 hr. The concrete had set enough by the next morning to permit workmen to walk on it. Cant strips of vermiculite were placed around all ventilator openings, outside walls and the expansion joint.

Next the remaining three sections of the roof were poured and allowed to dry for a week under favorable weather conditions. The built-up roofing then was applied.

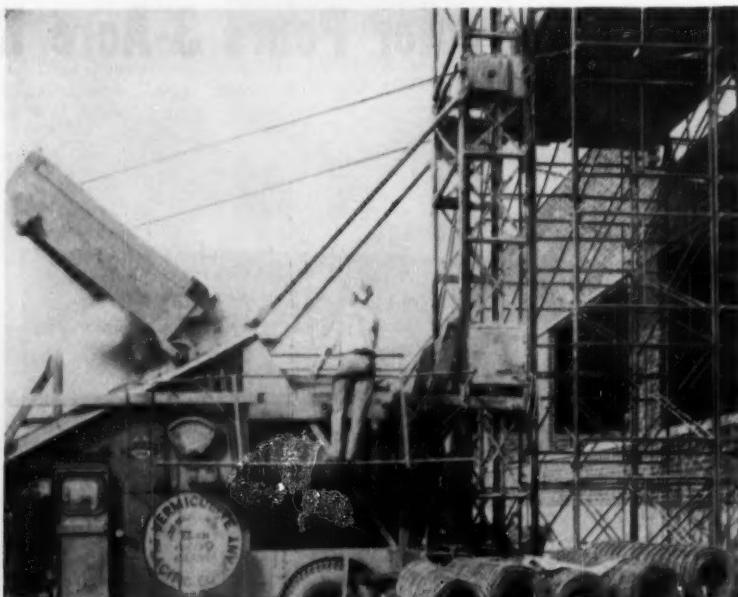
The entire roofing job required a 20-man crew, consisting of 3 welders, one Mixermobile operator, 2 men charging the batching box, one man on the roof hopper, 10 wheelbarrow operators and 3 cement finishers.



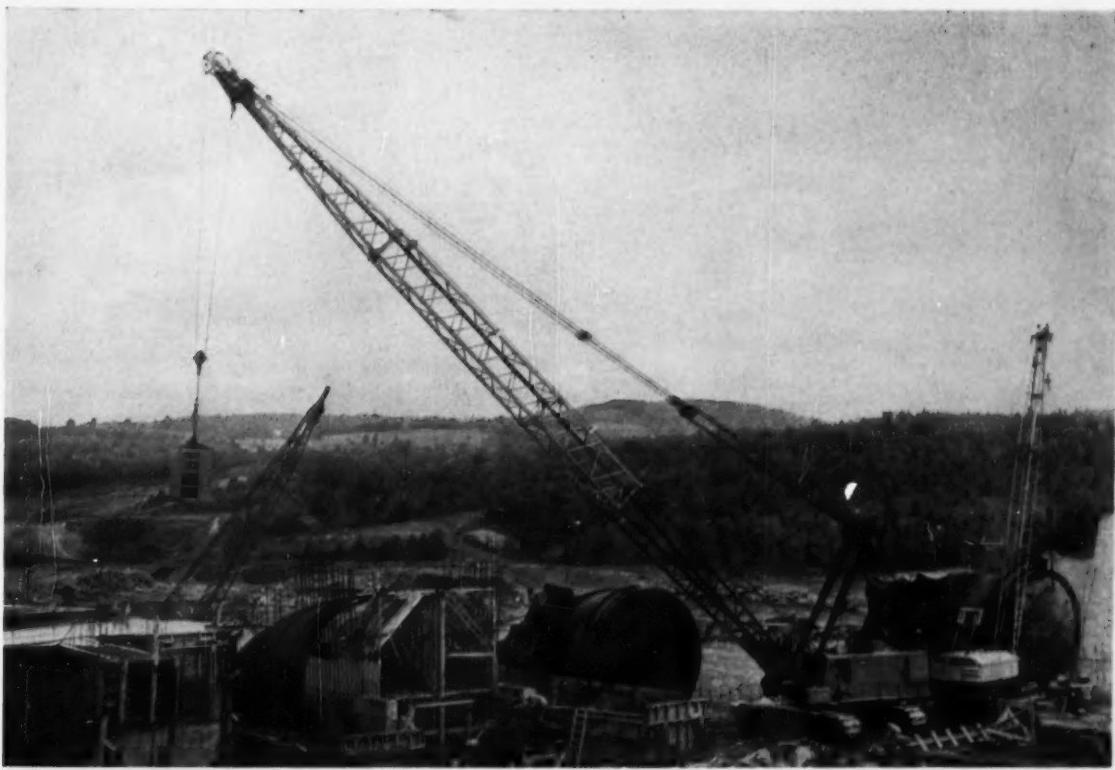
A 40,000-SQ FT SECTION of the roof required only 8 hr to pour. Two cement finishers screed the poured concrete with a wooden straightedge, while a third uses a bull float.



AFTER THE VERMICULITE CONCRETE had been allowed to dry for one week, 5-ply 20-yr bonded built-up roofing was mopped on. The roof is light weight, fire- and rot-proof.



VERMICULITE CONCRETE was mixed in this 50-cu yd per hr capacity Mixermobile. A bucket containing the concrete travels vertically in a tower and empties into a hopper on the roof.



Long Reach of 140-ft Aluminum Booms Helps . . .

Huge Crawler Cranes Pour Strung-out Dam

By A. C. SMITH, Associate Editor



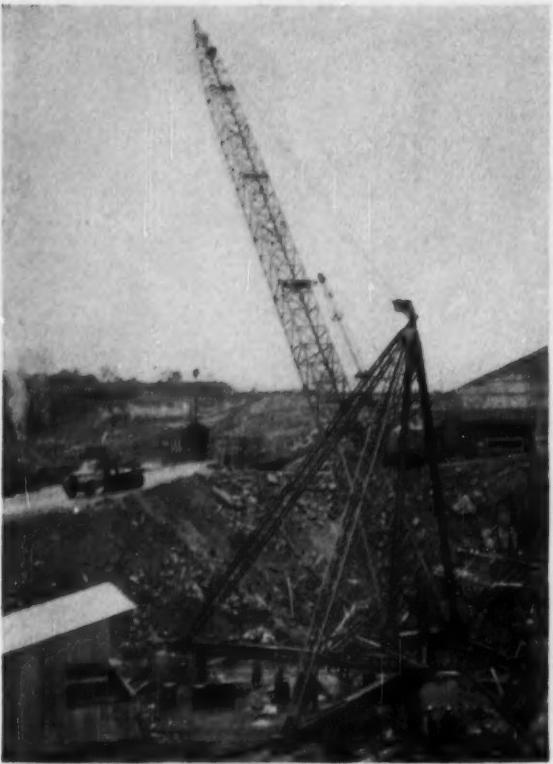
BATCH PLANT charged by 150-ft conveyor has capacity of 120 cu yd per hr. Johnson automatic controls quickly make batches and drop them into two Koehring 2-*yd* tilting-type mixers.

BECAUSE OF THEIR FLEXIBILITY, large crawler cranes are doing a fast job of placing concrete in strung-out parts of Littleton Dam in northern New England. Two huge Manitowoc 4500's travel over much of the Connecticut River site, move in close to the pours, and place more than 100 cu yd per hr apiece. With 140-ft aluminum booms, they can reach out 100 ft with a 4-yd bucket.

The crawler crane method of placing was selected over cableways and trestles because of the strung-out shape and also the small amount of concrete. Much of the 220,000 cu yd required goes into retaining walls that project beyond the normal reach of cableways or trestle cranes.

In fact, the retaining wall that separates the earth and concrete sections of the dam contains nearly 60,000 cu yd of concrete. It is 750 ft long and 150 ft high. The main concrete structure runs at right angles to the retaining wall. It consists of a non-overflow section 115 ft long, an intake structure 255 ft long, a spillway 373 ft long, and another non-overflow section 120 ft long. An earth-fill embankment north of the main concrete structure will be about 2,000 ft long and contain 3,000,000 yd of material.

Contractor on concrete work is Morrison-Knudsen Company, Inc. B. Perini & Sons is handling all ex-



STIFFLEG DERRICK with 105-ft boom places concrete in powerhouse. Huge American rig is operated by 2-drum hoist powered by 100-hp electric motor. Swinging is controlled by one-drum hoist.



PIT GRAVEL excavated from esker near the dam site is dumped from a Euclid end-dump truck into a Cedarapids 18x36 jaw crusher. Syntron feeder moves the material to the conveyor.



AGGREGATE PLANT turns out two sizes of sand and four sizes of stone at the rate of 175 tons per hr. Plant is rated higher, but an

excess of fines cuts production. A Hewitt-Robins screen scalps off most of the fines before they reach the main plant.

cavation and embankment. Ebasco Services, Inc. is managing construction for New England Electric System, the owner.

M-K's jobs consist of producing aggregates, batching and mixing concrete, and placing it in the forms. Aggregates are crushed and screened at a plant set up in a glacial esker adjacent to the dam. Concrete is batched and mixed in a Johnson automatic plant, and dumped into buckets carried on trucks. The two Manitowocs mentioned before place concrete in the dam, and an American stiffleg derrick places it in the powerhouse.

The aggregate plant is designed to turn out about 250 tons per hr, but an excess of fines in the raw material cuts production to an average of about 175 tons per hr. To increase the percentage of coarse material fed to the plant, scrapers strip the esker continually to locate the best veins. In fact, nearly 5 yd of gravel are stripped for every one yd sent to the crusher.

Coarse gravel is excavated by a Northwest 80D shovel and hauled to the plant in Euclid end-dumps. The 17-yd loads are dumped into a hopper placed over a Cedarapids 18x36 jaw crusher. Crushed material is conveyed to a Hewitt-Robins 4x12 screen which



Typical on-the-job
summary of a
CAT* Motor Grader's
performance:

"MOST WORK... LEAST COST!"

THIS Cat No. 112 Motor Grader is building about $2\frac{1}{2}$ miles of streets in a subdivision of Napa, Calif. Foreman A. B. Gerding of the A. C. Raisch Co. sums up its performance as follows: "There just isn't any other equipment but Caterpillar-built equipment for contractors. They do the most work for the least cost."

That's a typical report on Cat Motor Graders on all kinds of road construction, from suburban streets to cross-country highways. In three sizes of varying horsepower, they meet all job requirements. Each model is engineered to outwork and outlast any other unit in its power class. Here are some reasons why they'll give you superior performance: The *only* motor graders built by one company, their power is balanced to weight and working speeds for maximum production. Their Caterpillar Diesel Engines use low-cost No. 2 furnace oil without fouling for a three-way saving—cheaper fuel, less of it and less maintenance. And their efficiency is increased by many features. For example, the engine can be started from the cab. Visibility is excellent—sitting down, the operator has an unobstructed view of

the blade and the job. Anti-coast brakes prevent "creeping"—the blade stays where he puts it. Blade-positioning is fast—less than a minute for most positioning without leaving the platform!

How do these money-making machines stand up? Here's a clue: 99% of all rugged yellow motor graders ever built are still in use! Get the complete picture from your Caterpillar Dealer, nearby for information, for service. Name the date—he'll demonstrate!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—R

99% OF ALL CAT
MOTOR GRADERS EVER
BUILT ARE STILL IN USE

In hand hoists— It's Coffing

OVER 80 SIZES AND MODELS
TO FILL ALL YOUR NEEDS



**SPUR-GEAR
HOISTS**
22 models —
1/4- to 25-ton



**SAFETY-PULL
RATCHET LEVER
HOISTS**

10 roller-chain
models — 1,500-
to 30,000-lb. ▶

4 coil-chain
models — 1,500-
to 10,000-lb.



**CHALLENGER
LIGHTWEIGHT
ALL-STEEL
SPUR-GEAR
HOISTS**
3 models — 1/2-,
1-, and 2-ton



**MIGHTY-
MIDGET
PULLERS**
2 sizes — 500-
and 1,000-lb.



HOIST-ALLS two sizes —
1-, and 2-ton capacities

also:

EXTENDED HAND WHEEL HOISTS
6 models — 1/4- to 3-ton

ARMY-TYPE HOISTS
(plain and geared)

11 models — 1/4- to 10-ton

LOW HEADROOM HOISTS

12 models — 1 1/2- to 24-ton

CLEVIS-CONNECTED HOISTS

11 models — 1/4- to 10-ton

DIFFERENTIAL CHAIN HOISTS

2 sizes — 1/2- and 1-ton

HOIST BINDER

3,000-lb. capacity

Ask for more information on the units you need from the most complete line of hand-operated hoists. Write Dept. D1.



REVOLVING SCREEN, a 6-ft dia Telsmith, scalps off 3- to 6-in. aggregate. Sand jacket picks up fines and sends them to the classifier. Coarse particles under 3 in. are sent ahead.



VIBRATING SCREEN with three decks re-washes coarse aggregate, separates it into three sizes, and sends it out on stockpile conveyors. Stone ladders in the stockpiles reduce breakage.



STOCKPILED AGGREGATES are loaded into dump trucks with Pettibone-Mulliken Speedell. Fast-moving rig loads about ten 1 1/4-yd buckets in 4 min. Haul to batch plant is only 1/2 mi.

COFFING HOIST COMPANY
DANVILLE, ILLINOIS



scalps off excess fines and sends them to a waste stockpile.

The rest of the material is conveyed to a Telsmith 6-ft-dia revolving screen which scalps off and washes the 3- to 6-in. aggregate. A sand jacket on the revolving screen picks up fines and sends them down to be re-washed, classified into two sizes, and stockpiled.

Coarse aggregate smaller than 3 in. is carried beyond the revolving screen to a 3-deck vibrating screen where it is re-washed, classifies it into three sizes, and then stockpiled. Stone ladders at the end of each stockpile conveyor reduce breakage. Nearly 2,000 gpm of washing water is supplied by a Jackson 10-in. pump set up in a pond near the river. All screens, the crusher, and the Cedarapids head pulleys on the conveyors are powered electrically.

Batch Plant

Trucks are loaded at the stockpiles by a Pettibone-Mulliken Speed-all and haul the short distance to a hopper next to the Johnson batch plant. Here, a 30-in. belt conveyor 180-ft long picks up the aggregate and carries it to the bins on top of the plant. A bucket-elevator system transfers the cement to the 400-bbl bin on the plant or to any one of three 875-bbl silos.

Water for the mix is tapped off the main 8-in. line that serves the whole dam. The line is fed by a 12-in. Layne electric pump. In case of power failure, a 10,000-gal storage tank can supply the plant for several hours.

Automatic Controls Speed Batching

Cement and aggregates are batched automatically and chuted into two Koehring 2-yd mixers. Water is added automatically, the batch is mixed, and dropped into a hopper. Flat-bed trucks carry 4-yd buckets under the hopper, load and then haul to the pour. The truck with the loaded bucket parks next to the one waiting for the crane to return its empty bucket. In this way, when the empty bucket is placed on the truck, a workman can unhook it, and quickly step across to the other truck, and hook up the loaded bucket.

The Manitowocs quickly swing the buckets to the pour where workmen empty them pneumatically. Concrete is placed in 5-ft lifts inside of Blaw-Knox canti-

NEW

Scientific Advance in Head Protection

Internal as well as External head protection achieved by patented "geodetic" suspension in New Willson Super-Tough® Hats and Caps.



Realizing that most fatal head injuries are due to shock to the brain rather than injury to the skull, the Cornell Aeronautical Laboratories designed and patented a new suspension system for industrial safety hats that provides maximum protection and comfort to the wearer.

This patented suspension is available only in Willson Super-Tough® Hats and Caps!

This suspension is made up of "geodetic" crown straps scientifically located to distribute the force of a blow over the entire

head—not concentrate it in a small area on the crown of the head. In addition, the tough Fiberglas hat shell is made safer and more comfortable to wear by the pneumatic cushioned head band. This pneumatic cushion absorbs and distributes the force of lateral blows through a series of metered, interconnected air cells.

Write today for the new Willson Super-Tough® hat bulletin which describes in detail the "why and how" of these new Willson Super-Tough® hats with the advanced, patented suspension.

----- Clip and mail coupon for latest head safety information. -----

Please send me your bulletin on the new Willson Super-Tough® Hats and Caps with "geodetic" crown straps and "pneumatic" head band.

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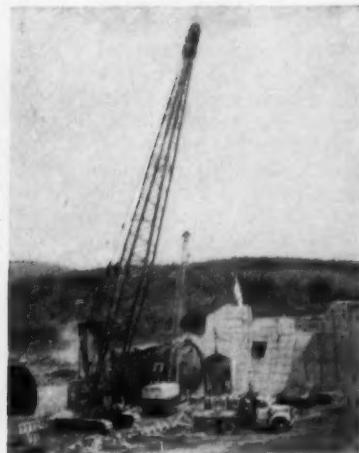
WILLSON

Leaders in Research and Development of Safety Equipment Since 1870
141 Thorn Street • Reading, Penna.

AGGREGATE PLANT AT LITTLETON . . . Continued



ELECTRIC PUMP set on pontoons in pool supplies water for both the dam and the batch plant. Leyne 12-in. unit pumps through 8-in. line to the dam where it splits into two 4-in. lines. Main line also keeps 10,000-gal storage tank filled in case of power failure. Diesel pumps are kept on hand for emergencies.



LONG-BOomed MANITOWOC 4500 picks up 4-yd bucket from flat-bed truck and swings it over dam. Maximum radius with this load is 100 ft.

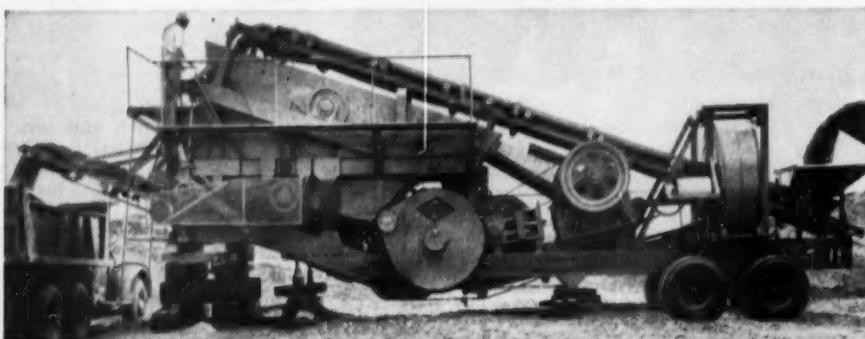
lever forms. Two-man vibrators consolidate the mix.

At the powerhouse, concrete is placed by an American stiffleg derrick with a 185-ft boom. The big rig can handle a 4-yd bucket at a

140-ft radius. It is operated by a 2-drum hoist powered by a 100-hp electric motor. A 30-hp motor powers the one-drum swinging hoist.

John Armitage is project man-

ager for Morrison-Knudsen. Jack McKamey is project manager, and Roger O'Reilly is resident engineer for Ebasco Services. Fred Kennison is field representative for New England Electric System.



"77" PLANT (Illustrated)
Rotor-lift Plant for high-crushing capacity and mobility in the pit; also for ease of travel on the highway.

EVERYTHING FOR THE AGGREGATE PRODUCER



There's a unit to fit your production needs, do a job faster and at lower cost.

DIAMOND CRUSHING EQUIPMENT

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The Engineers' Report

CASE HISTORY

Chevron Starting Fluid
PRODUCT

**San Francisco Chemical Co.,
FIRM Montpelier, Idaho.**

Fast starts save 50 man-hours each day!



WITH TEMPERATURES DOWN TO 20 BELOW ZERO for weeks, Chevron Starting Fluid speeds up starts of trucks, tractors and shovels at San Francisco Chemical Co.'s phosphate mine at Leefe, Wyoming. Winter temperatures here sometimes drop to 50 below zero, but even then Chevron Starting Fluid makes it possible to start both diesels and gasoline engines. According to Mr. P. S. Pugmire, General Superintendent, this occasionally saves the mine up to 50 man-hours a day — about 2 hours starting time for drivers of trucks and tractors, also time of other workmen who cannot begin work until equipment is operating. Chevron Starting Fluid is available in 1-pint cans and in 7- and 17-cc gelatin capsules. Your supplier also has the new Chevron Pressure Primer System using safe 9.9-cc pressurized steel bulbs which, when punctured, force priming fuel into air intake system, permitting instant ignition.

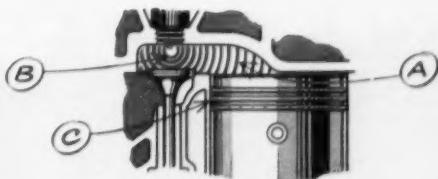
FREE FOLDERS tell you more about Chevron Starting Fluid and the Chevron Pressure Primer System. Write or ask for them today.

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your distributor, write or call any of the companies listed below.



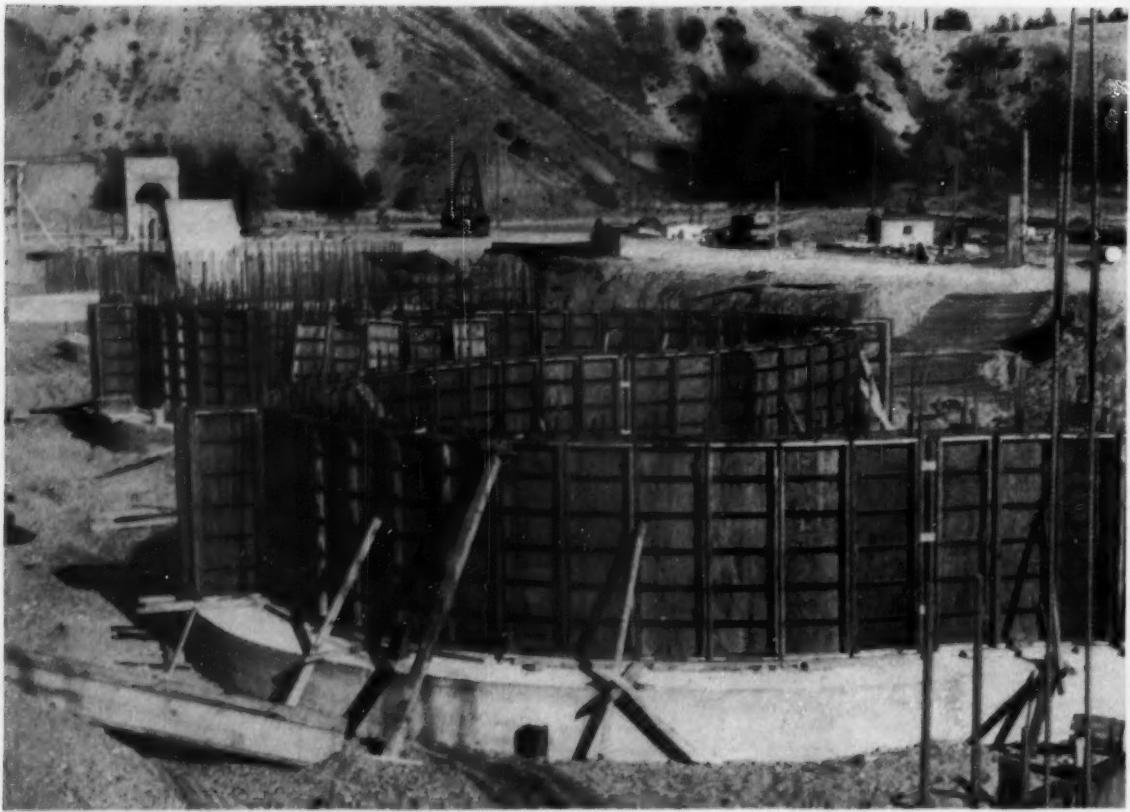
TRADEMARK "CHEVRON" REG. U. S. PAT. OFF.

How CHEVRON Starting Fluid Starts Gasoline and Diesel Engines Instantly



- A. Atomizes in lowest temperatures and provides easily ignited vapor in combustion chamber.
- B. Pressure, or the weakest spark, fires mixture—turns engine and heats air for regular fuel mixture.
- C. Contains lubricant and additives—inhibits cylinder wear and ice formation in primer equipment.

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THE CALIFORNIA OIL COMPANY, Barber, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado**



SHARPLY CURVING free-standing concrete walls 40 ft high and 15 in. thick were built with fir plywood form panels with curves shaped to a radius of 15½ ft for sand and gravel storage near Seattle. Butler Construction & Engineering Co. is contractor.

Why Use Prefabricated Form Panels?

By JOHN G. SYMONS, President,
Symons Clamp and Manufacturing Co.

PREFABRICATED FORM PANELS have become more and more popular during the last few years, for several important reasons:



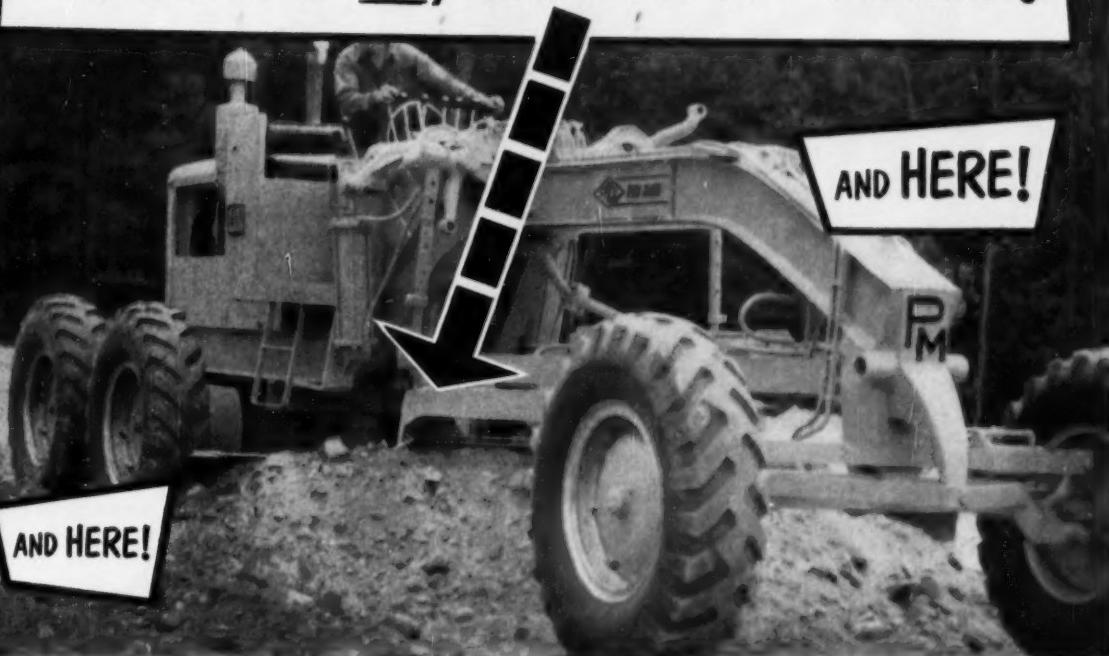
METAL FRAME FORM PANELS used by Kepler & Huth, Chicago builders, are preferred for their multiple-use advantage. Firm begins pours at four corners simultaneously.

1. Labor costs are reduced by replacing a field-built product with a factory product. The prefab form goes together easily, accurately, and with little effort. It does the job efficiently because it has been well-engineered and well-built. After the work is complete, the forms are easily disassembled, cleaned and oiled and then are ready for the next job instead of the scrap pile.

2. Their longer life means a lower material cost per use. Two points should be mentioned here; first, proper care of the forms is necessary to obtain the maximum number.

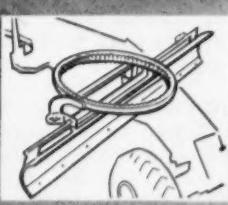
(Continued on page 88)

The **GUTS** of Any Grader Shows **HERE!**



All the Fancy Talk About the Gimmicks Can't Deny that **POWER** Must Always Be the **FIRST** Consideration

MOST CIRCLE POWER



Write for free
44 page Booklet
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The thing that pays off in grading is **POWER** . . . put out as the Pettibone Speed Grader delivers it! Owner after owner is demonstrating this every day . . . moving full moldboard loads. Hang that tremendous moldboard power onto the strongest frame of *any* grader, back it with the heaviest tandems made . . . and you have a power combination that has no equal!

Dimension after dimension of Speed Grader's hydraulic power system is consistently bigger. One of the five Speed Grader sizes, with hydraulic booster or full hydraulic finger-touch steering will do your jobs at less cost. A demonstration will bring convincing proof. It's worth taking a few moments to ask for it!

Ask for Bulletin P136.

STRONGEST FRAME



HEAVIEST TANDEMS



HYDRAULIC CONTROL



Without an Equal!

PETTIBONE

SPEED GRADER

*Eliminates the Weaknesses
of All Other Graders!*

Another Member of the Labor-Saving
"Speedy" Material Handling Family!

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ROME, NEW YORK

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SNOW FLOW



BULL DOZER BLADE



OPTIONAL
HYDRAULIC
MOLBOARD SIDESHIFT



"Baby Digger" truck loads in close quarters, has big capacity, digs up to 20" wide, 5' deep

This East Ohio Gas Company job, the replacement of a main extension, shows why the Cleveland Model 92 "Baby Digger" is so widely used for city digging. The "92" puts the edge of a trench within 17 inches of a parallel wall, loads excess spoil directly into trucks at the curb, and affords the operator full visibility of the whole job.

Its exclusive Cleveland multispeed transmission provides over 30 evenly graduated digging wheel and crawler speed combinations, from 6 inches to 30 feet per minute. Its lower wheel speeds enable it to pick its way safely through the numerous underground obstructions typical of city digging. The three lower of its four wheel speeds provide the correct power applications for digging in even the toughest soils. And its highest speed combinations, of course, assure high

daily footage on jobs where high production rates can be used to advantage. It has ample capacity for trench from 10 to 20 inches wide, down to 5 feet deep.

Compactness, maneuverability, speed combinations, capacity — if most of your trenching jobs are city jobs, the "92" is the trencher for you!



And does it get around! The "92" hustles safely from job to job . . . at legal limit speeds . . . because it's so easily portable on the drop-axle, tilted Cleveland T5 Trailer.

Write for the CLEVELAND Full-line Bulletin
or see your Local Distributor

THE CLEVELAND TRENCHER COMPANY
20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO



CLEVELAND

WHY PREFAB FORMS? . . .

Continued from page 86

ber of uses and second, the forms must be used in order to obtain their full value. It follows that the advantage of prefab forms can be exploited best by the contractor who has many concrete forming jobs.

3. The need for experienced supervision is less essential with prefabricated forms than with built-up forms. Prefab forms are built to withstand heavy pressures, and their ties and spreaders are spaced correctly to take the stresses of rapid pouring, vibration and concrete dumping. Good results and freedom from form failures may be obtained, even if the form crew is inexperienced and supervision is scanty.

4. Prefabricated form manufacturers provide engineering services which materially help the contractor in estimating the job. Form layouts showing the location and use of the forms, and bills of material stating quantities and costs are provided without charge by most manufacturers. In addition, field engineers are available.

5. In addition to labor savings, there is an advantage in the saving of time on the job. With a greater efficiency of forming, the same square footage of forms may complete a job in a much shorter period. Other considerations for prefab forms include the ease with which these units may be handled, stacked and trucked. Also prefab forms require considerably less waling and bracing than the typical field-built forms.

Prefabricated form panels are of two general types: those having plywood faces and those having metal faces. The plywood face types fall into further classification because of their frames: some have metal frames; others have wooden frames. All of the metal face panels have metal frames. The type of metal used is generally steel, although magnesium and aluminum facing and frame are available.

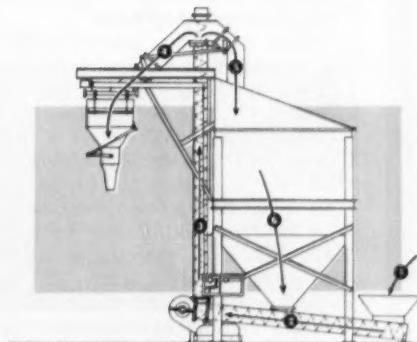
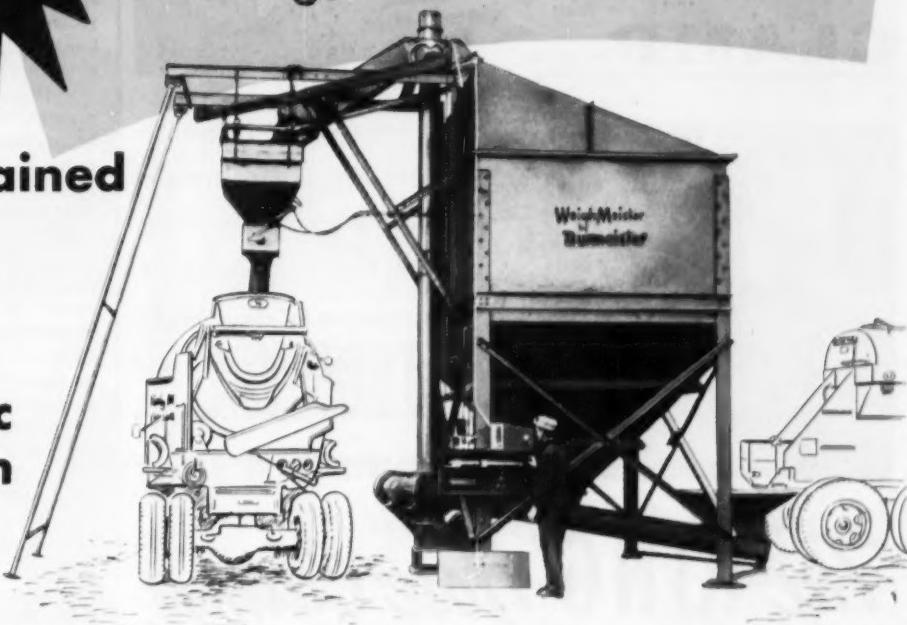
Each manufacturer has his own method of assembling adjacent panels together and holding opposite panels a specific distance away. These methods of assembly and the spreader and tie action are generally patented. In addition to patented forms, there are many systems which contractors have developed for their own par-

NEW

**Self-Contained
Portable
Accurate
Automatic
Operation
Fast!**

WeighMeister

Screw-Action Batch Lift



① Bulk cement is delivered at track site or from truck at ground level. ② Feeder screw delivers to WeighMeister's vertical screw. ③ High-capacity vertical screw lifts cement to ④ precision batcher, which dumps either automatically or at operator's control. ⑤ When pre-set weight is reached, flow automatically shifts to storage bin. ⑥ Between bulk deliveries, cement flows by gravity from storage bin to feeder screw. Controls can be set to stop feeder and vertical screws automatically, if desired, when weight is reached.

Delivery and batching are completely independent, go on simultaneously without interfering with each other. WeighMeister may be used without bin at track site for batching or transfer plant.

WeighMeister gets its capacity from the fast-working screw lift. The precision-fed batcher and automatic electro-pneumatic controls give it dependable accuracy for constantly uniform mixes. One man operates the WeighMeister by three push-buttons, with no manual levers to waste time and cause error. Low bin cuts height in half, saves on weight and initial cost. The WeighMeister is totally self-contained with its own compressor for the automatic controls and its own electric motor or gas engine. All air and electric lines are permanent; no connections to waste time in moving. Makes light, compact, integral unit easy to set on single truck. Needs no footings or ramps. Just set WeighMeister on any firm, level spot—have it running in a short time. See your distributor or write for details. L. Burmeister Co., 4541 W. Mitchell St., Milwaukee, Wis.



THIS is the CLAMP...



which meets the widest possible range of service on all types of heavy or light wall hose. The strongest of its kind, it is easiest to attach, provides a full-circumference grip on the hose; and can be used over and over again... always with the same sure holding power.

The "KING" Hose Clamp

SINGLE OR DOUBLE BOLT

Made of tough, durable malleable iron... completely rustproofed.

Reinforced bolt lugs cannot bend out of shape. Full width tongue assures a perfect seal. Ears for vise jaws are also full width. On the double-bolt style, double-tongue saddles bridge the space between bolt lugs, assuring full-width compression over entire hose circumference.

"King" Clamps are made in Single Bolt style to fit hose from $\frac{7}{8}$ " to $5\frac{1}{4}$ ", and in Double Bolt style for hose from $3\frac{1}{2}$ " to $17\frac{1}{4}$ ". Double Bolt style is illustrated at right.



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WHY PREFAB FORMS? . . .

Continued from page 88

ticular use. These home-made methods are quite effective, particularly where the superintendent takes a personal interest in the method he has developed himself.

Certain types of prefabricated panels have been custom-built for specialized purposes such as dams, tunnels, bridges and other heavy-duty jobs. Others have been built specifically for house foundations. However, most prefab forms have been designed for general construction and are suitable for schools, hospitals, sewage disposal plants, water filtration plants, stores, apartments, office buildings and factories.

Ties for the various form panels range in strength from 1,000 to 3,000 lb. These ties are placed in standard positions, and the positions are spaced an even distance apart. Where the concrete pressure is great, ties may be placed every 12 in. If pressure is low, ties could be placed 24 or 36 in. apart.

Most prefabricated form panels have standardized on 2-ft widths with lengths of from 3 to 8 ft. However, some panels are available in 30- and 36-in. widths. These larger widths require the ties placed within the panels rather than at the edge of the panels. Spacing of the ties at the edge is the most common method, as it is claimed to provide a faster erection and stripping time.

Most panel ties are expendable with ends that may be broken off. However, some ties are removed, leaving a hole which has to be plugged later. There is a large range in the price of prefabricated forms. It is possible to buy the form hardware from some manufacturers and build your own panels. But most manufacturers sell only the complete units.

A partial list of the manufacturers making prefabricated form panels is as follows:

Blaw-Knox Co., Pittsburgh
Economy Forms Corp., Des Moines
Gates & Sons, Inc., Denver
Hummel Form & Clamp Co., Chicago

Irvington Form & Tank Corp., New York

Low Cost Forms Co., Jackson, Miss.
Simplex Forms System, Inc., Rockford, Ill.

Superior Concrete Accessories, Inc., Chicago

Symons Clamp & Mfg Co., Chicago
Universal Form Clamp Co., Chicago



Two "600" portables at work on a mountain road job.



Three "600" compressors used on the New York Thruway.



A "125" operating on roof of a Dallas skyscraper.

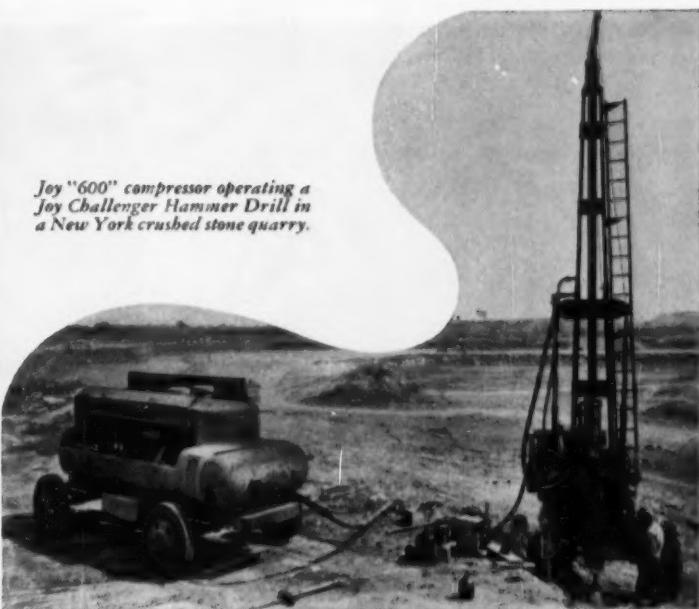


This "315" powers paving breakers on a Pittsburgh construction job.



A "600" with Joy Wagon Drills on a Philadelphia housing project.

Joy "600" compressor operating a Joy Challenger Hammer Drill in a New York crushed stone quarry.



JOY PORTABLE COMPRESSORS ...efficient, dependable in all kinds of service

You'll find Joy Portable Compressors on a variety of jobs, in all parts of the world. Check the owners . . . you'll get reports of consistently fine performance and complete dependability from the tried and true design.

Joy's background of 45 years in the portable compressor field has paid off in the development of these many fine features found in all Joy portables:

FOR PERFORMANCE Low-lift, large port-area, "direct-concentric" valves. Efficient air cooling, cross-flow intercoolers, matched engines, full force-feed lubrication to every bearing and working surface.

FOR DEPENDABILITY Oversize receivers, main bearings and starting equipment. Three-point engine-compressor suspension, rifle-drilled connecting rods and lightweight pistons. Welded steel frames and "bulkhead" body construction.

Five sizes are available—from 75 to 600 cfm. For details on how you, too, can benefit from Joy's field-proved design, write for free bulletin #A-55, to **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: **Joy Manufacturing Company (Canada) Limited, Galt, Ontario**

*Consult
a Joy
Engineer*





NEW LETOURNEAU-WESTINGHOUSE Model B Tournapull and Scraper is a 293-hp, 23-cu yd capacity unit. All major assemblies,

such as transmission, final drive and differential, are easily accessible for maintenance or replacements. Note low push-bar.

It's an All-New Model B Tournapull and Scraper

By RALPH H. LEWIS, Associate Editor

EARLY LAST YEAR the pilot model of the new Model B Tournapull and scraper made its appearance—the first new product designed and built by LeTourneau-Westinghouse Co., Peoria, Ill. CM&E is privileged to bring you this first exclusive report on the new unit which will be announced

to the trade the latter part of this month.

The Model B is a big, powerful 293-hp, 2-wheel rubber-tired tractor with excellent accessibility for quick and easy replacement of component assemblies. All major assemblies such as transmission, clutch, final drive and differential

can be lifted from the machine without the necessity of time-consuming handling of other components.

The scraper is big, too, capable of carrying a heaped load of 23 yd and 18 yd struck.

The new unit measures 40 ft 6 in. in length, 11 ft 8 in. in width

We asked the operator what he thought of the Model B...



• Operator A. L. Griffin, right, shown here with Contractor M. Vander Hayden of Dyer Construction Co., Dyer, Ind., has operated the Model B and scraper for two months on a highway relocation project in Indiana. Here's what he had to say about it:

"I believe the visibility to watch the scraper load could be improved. (LeTourneau-Westinghouse engineers agreed with him. They said they would have to sacrifice important tractive effort if they made this change, but feel the operator has enough visibility to do the job.) The riding abilities of the B are good compared to other equipment I've operated. I've operated it 18 hr at one stretch and come back the next day for my regular shift. The scoop loads good."

"I like the shifting set-up. With the clutch brake I can move through the shifts without scratching a gear."

"I believe the engineers could do something about the seat, though. They should make it adjustable and design it so it could be pushed out of the way, or folded back. That way, if the operator wants to stand up during loading, he could relieve the monotony of sitting. (LeTourneau-Westinghouse engineers do not agree. They claim such an arrangement would bring up a serious safety problem.)"

"The steering wheel and controls are easy to operate, and I like the quick release feature on the scraper."

"I haven't tried to baby this outfit in any way. I guess I can say it's a good piece of dirt-moving equipment."

How
Bucyrus-Erie's
**BOOST
YARDAGE**

THREE WAYS



1. POWERFUL DIGGING ACTION

Bucyrus-Erie excavators give you more useable power at the dipper. Engines are "tailored" to meet the demands of excavator service — there's less pull-down under sudden loads, more lugging power at slow speeds, and they regain speed quickly. There's a minimum loss of power, too, because there are fewer wearing parts and anti-friction bearings are used liberally.

2. RAPID HOIST AND SWING

Smooth coordination of all functions in the hoist and swing cycle speeds operation and increases output. Instant-acting controls deliver quick acceleration and deceleration, accurate stops. There's no excess weight to slow operation — you get maximum working ability per pound of weight.

3. LESS DOWNTIME, MORE WORKING TIME

The right combination of power and speed assures you of efficient excavating. Right design and construction throughout means not only sustained high output, but also low operating costs, low repair costs, and long machine life. All are yours with Bucyrus-Erie Individual Design.

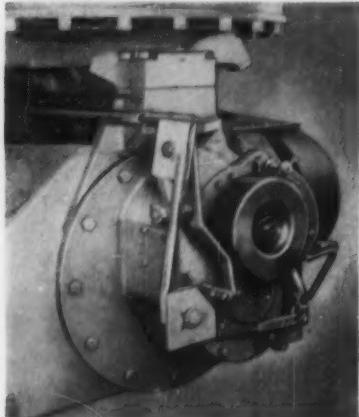
With Bucyrus-Erie's unique Individual Design of every model in the line, each component of a particular machine is matched to the job it must handle. You get an excavator that's built *right* from boom point to treads. See your Bucyrus-Erie distributor soon for the complete story.

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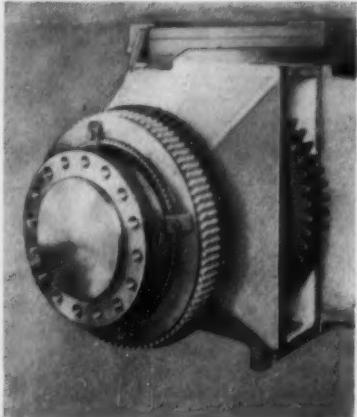
BUCYRUS-ERIE COMPANY South Milwaukee, Wisconsin



SHOVELS • DRAGSHOVELS • DRAGLINES • CLAMSELLS • CRANES

MODEL B TOURNAPULL ... Continued

AMONG THE NEW FEATURES of the Model B is this positive hand-operated parking brake. It locks the transmission output shaft.



FINAL DRIVE gears and brakes can also be removed without major disassembly. Note heavy-duty final drive bull gear.



STEERING GEAR BOX and motor have been relocated on the Model B. They are out in the open directly behind operator.

and stands 12 ft 7 in. high. It has a 22-ft wheelbase. The 27.00x33, 30-ply tires are interchangeable between the Tournapull and scraper. Gage width from c to c of tires on the tractor is 9 ft. On the scraper it's 7 ft 2 in. There is plenty of ground clearance on the Tournapull—25 in. On the scraper it measures 20 in. The entire unit weighs 63,000 lb.

Now Has a Steering Wheel

To help give the operator of the new unit a better "feel," a steering wheel has been put on the new Model B. The electric system of steering has been retained but now uses an over-ride principle with a feed-back arrangement, which

eliminates past objectionable features, such as sticking relays and severing of critical lines.

The electric control system which has proved so successful on past LeTourneau equipment is still being used, but with added improvements. It consists mainly of an electric generator, driven by an engine with electric motors powered from the generator. It is an ac system.

One major redesign of the new model is the relocation of the steering motor and steering gear box. It is now directly behind the seat at operator level and entirely in the open. Tests proved the motors can be left unprotected as water, dirt, dust, etc., seem to have little

effect on their successful operation. LeTourneau-Westinghouse engineers have had a similar motor completely submerged in water for the last 8 yr, and it still operates.

AC-type motors of 120-cycle, 3-phase, 300-v design are used for hoisting, dumping, steering, etc.

The present pilot model is powered by a Cummins diesel 600 6-cyl 293-hp engine with a Fuller 5-F1220 transmission with LeTourneau-Westinghouse design transfer case which permits a 10-speed transmission. The transmission is equipped with a clutch brake which permits easier shifting when moving through 10-speed range. Speed of the unit ranges from 2.00 to 24 mph.

The proved torque-proportioning differential, which limits wheel spin in soft material and compensates on turns is incorporated in this new Model B.

The scraper also boasts of a quick-release clutch arrangement operated by air to get pumping action enabling the operator to get a heaped load quicker, especially in sand or loose material.

The push plate on the scraper has been lowered and made stronger to handle the added stress of the new giant-size tractors. In addition to being tied in to the side plates, the push plate is now also tied into the bottom of the pan for additional strength.

The wheels of the scraper are now located inside the cutting edge for better mobility in soft ground and, more important, for cutting slopes.

Brakes are disk type, air-operated, with more than 7,536 sq in of braking surface. On hauling units

(Continued on page 96)

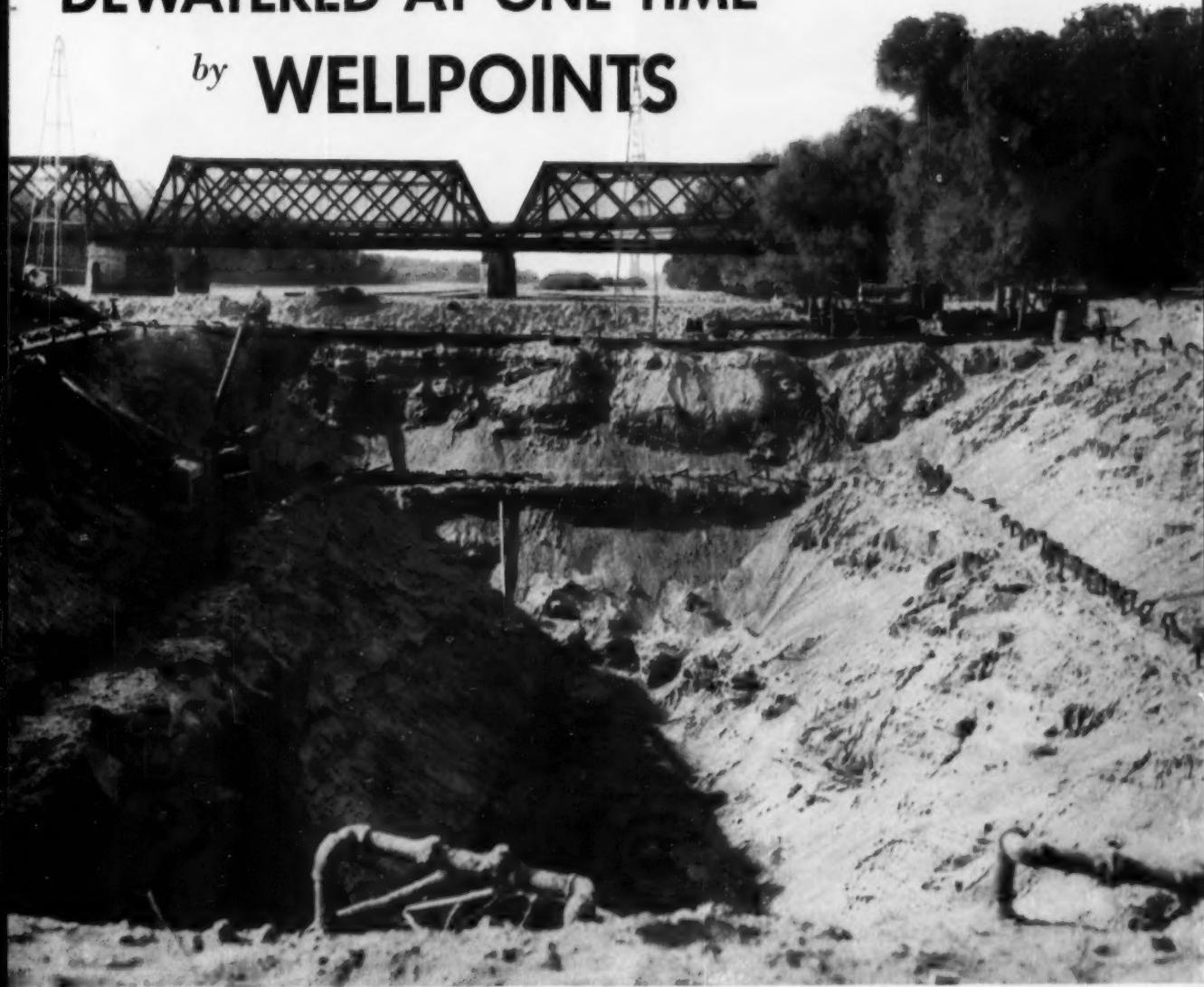


TURNING RADIUS on the new unit is only 17½ ft. Maximum turning angle is 90 deg. right or left. Tires, 27.00x33 size, are interchangeable between tractor and scraper.

Seven deep bridge piers 100 ft. apart

DEWATERED AT ONE TIME

by **WELLPOINTS**



Contractor for the substructure: McCarthy Improvement Co., Davenport, Ia.

This is Pier #4, one of seven being constructed for the new Clinton-Illinois Mississippi River Bridge. A Moretrench Wellpoint System pumped 25' of water out of this hole leaving it safe and dry for pile driving operations. No sheeting was needed. A common suction line linking each pier eliminated several pumps.

Expert planning, careful installation and supervision
of the pumping system insured progress
on this job right from the start.

**MORETRENCH
CORPORATION**

For full details on how to work economically in the dry, contact our nearest office.

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New York 6

4900 S. Austin Ave.
Chicago 38, Illinois

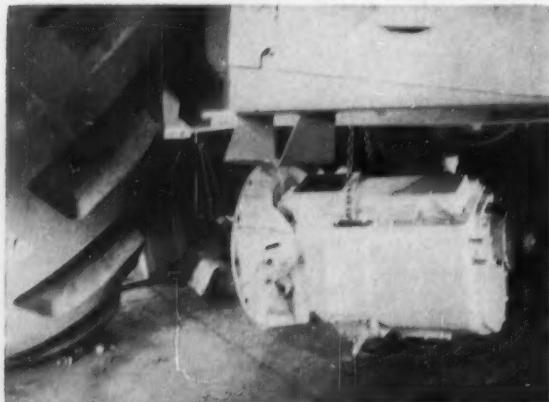
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Tampa 9, Florida

315 W. 25th St.
Houston 8, Texas

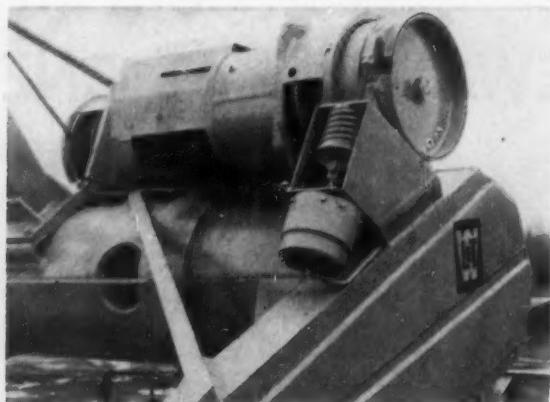
Rockaway
New Jersey

Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington

Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario



REMOVAL OF COMPLETELY REDESIGNED transmission group on the new tractor is now a relatively simple matter. The unit is disconnected and lowered out the bottom without jacking the tractor.



SUCCESSFUL ELECTRIC CONTROL has been retained on the tractor and scraper. This is the body hoist motor with quick release arrangement for pumping action. The motors are ac type.

they can be applied independently on front or rear or on all four wheels simultaneously.

Turning radius is 17½ ft and maximum turning angle either way is 90 deg.

The pilot model has logged more than 3,500 hr on all types of operations with a good share in the hands of a contractor on a Midwest project. Four other units

have been built and placed on construction projects in various parts of the country. You might have recognized one of them as they were painted gray instead of the conventional yellow. As a result of this testing, LeTourneau-Westinghouse feels the new Model B and scraper is ready to be sold. They are confident any "bugs or headaches" that arise will be of a

minor nature, and the company is prepared to handle and remedy them. They are hopeful the Model B and scraper will find ready acceptance in the field by contractors who are always on the alert for something new to move more dirt at less cost.

LeTourneau-Westinghouse feels the Model B is the answer to that problem.

What About the LeTourneau-Westinghouse Co.?

Behind the story of the development of the new Model B and scraper is another story that should be of interest to every earthmoving operator and contractor in the country.

It's the story of the new LeTourneau-Westinghouse Co. (1953) which adopted a new set of policies—a company that completely reorganized from top to bottom before a new product was built.

The name LeTourneau has been synonymous with the earthmoving equipment industry since 1929. In spite of many differences of opinion between the original LeTourneau firm and customers, no one will deny that R. G. LeTourneau himself is responsible for some of the most original and important contributions ever made to the industry.

The old Model B Tournapull—manufactured by the former company in 1947—and there weren't too many built—was plagued with final drive and transmission troubles. In addition, the Model B got the reputation for being one of the

most difficult in the field to repair. It was just too inaccessible.

When the announcement was made in May 1953, that another well-known name in the industry, Westinghouse Air Brake, had purchased R. G. LeTourneau, Inc., and formed the new company, things began to happen immediately.

First, the newly elected and youthful president, Merle R. Yontz, established a policy that the firm would not attempt to make a "splash" with a new model, but rather would design and build equipment that would eventually develop into a well-rounded, well-accepted line. "The machines we build now, and any in the future will be current as long as the machine operates. There will be no orphans in the LeTourneau-Westinghouse line," declared Mr. Yontz.

The new firm realized too that they had a gap in the number of sizes of scrapers and tractors they were building. A bigger unit was needed if they were to keep abreast of the increasing competitive field. Two months after the new firm

took over, the decision was made to design and build a new tractor-scraper unit, retaining the old model number, the "B." There was just one major requirement. The unit was to be new from "stem to stern," not just a beefed-up version of the old model B. Emphasis was placed on accessibility for easy maintenance and repair, capacity and power, and proper speed relation to meet all haul road requirements.

This move, together with other future planning, necessitated the immediate enlarging of the engineering department. Now it is four times as large as it was early in 1953. Heading the 60 full-time engineers is 44-yr-old Ernst Spannahke, Director of Engineering and Research.

The former organization often depended upon the sales in the field to prove up equipment, but all that has been changed now, according to Elmer Isgren, executive vice-president in charge of engineering and manufacturing. "We now have a 211-acre proving ground

Cities Service C-300 cuts make-up oil 600%!

**Stone cold facts from the
Chenoa Stone Company, Chenoa, Illinois**



Mountains of Work at Chenoa, Ill.

5 one-and-a-half yard shovels . . . 2 diesel-driven crushers . . . 2 Dumptors . . . a limestone crushing mill. Part of the equipment constantly in use at Chenoa Stone Company . . . constantly powered and lubricated by Cities Service products.

Here's the story in the words of David D. Vickrey, Superintendent of Chenoa Stone Company:

"About two years ago, we switched from another nationally prominent brand oil to Cities Service C-300 Series Motor Oil. The results have been amazing.

"C-300's detergent action completely eliminated a bothersome sludge problem. On our first three oil changes with it, we removed 5 gallons of sludge from each of our 200 horsepower diesels. Since then, these diesels have remained clean, and today, when we open the crankcase, we can even see the paint.

"We also are using far less oil between changes. In fact Cities Service C-300 actually cut make-up oil from 5 to 6 gallons every 150 hours to less than

one gallon every 150 hours!

"In addition to C-300 oil, we use Cities Service Lubricants for every requirement . . . Diesel Fuel, Gasolenes, Trojan M Grease and hydraulic fluid. We have been completely satisfied with every product.

"Cities Service has given us top-notch service, the best we've ever had. We are better supplied than ever and have learned to rely on Cities Service dependability."

There is nothing Cities Service could possibly add to Mr. Vickrey's statement, except a reminder to contact your local Cities Service representative in order that you may enjoy similar results in *your* operation. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES  **SERVICE**
QUALITY PETROLEUM PRODUCTS

SOIL-CEMENT PROCESSING of Mountain Highway Sets Production Record



Morrison-Knudsen purchased two Seaman Trav-L-Plants, built by Seaman Motors, Inc., Milwaukee, Wis., for one-mile-a-day production of high quality soil-cement base.

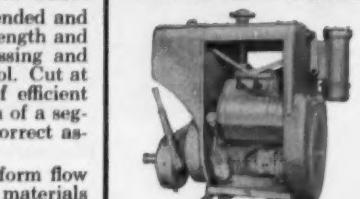
Road materials pulverized, mixed, blended and correctly assembled for maximum strength and durability require accuracy in processing and precision in moisture and depth control. Cut at lower right shows Seaman method of efficient binder application and the elimination of a segregated aggregate condition by the correct assembly of coarse and fine particles.

The Wisconsin engine provides a uniform flow of water or bituminous binder to the materials during mixing operation. Picture shows the Seaman in a mixing operation, preparatory to liquid application.

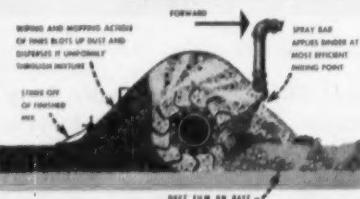
This is just another typical power assignment in which Wisconsin Heavy-Duty Air-Cooled Engines play important roles. Construction contractors, equipment designers and builders... men who are most familiar with power equipment service demands... specify "WISCONSIN ENGINES" as their best guarantee of dependable service and low-cost maintenance.

You can't do better than to specify "WISCONSIN" for your equipment. Write for Bulletin S-164.

with the Help of this **WISCONSIN** HEAVY-DUTY *Air-Cooled* ENGINE



Model VG4B Wisconsin Heavy-Duty Air-Cooled Engine specified as standard equipment on Seaman Trav-L-Plant. Equipped with Stellite exhaust valves and valve seat inserts and valve rotators for long engine life and minimum servicing.



WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

RETREAD CRAWLER-TYPE TRACTORS!



YOU BET! Use Marquette's "Tractor Strip", the easy to weld, low-cost retread that restores full pulling power to your worn grousters! No special rod or technique needed for fast, sound application. Cuts labor and "down time" to the bone! Special alloy is highly abrasion- and impact-resistant for extra long wear. Available in random-length bars of 10 to 14 feet, or cut to your specifications.

For complete information on low prices,
see your jobber or write:

MARQUETTE

MANUFACTURING CO., INC.

307 E. Hennepin Avenue, Minneapolis 14, Minnesota

staffed with full-time engineers. Every new product we build, will get a thorough testing, not only at proving ground, but also actually on the job in the field by contractors before it goes into production. Our warranty on new machines says we will stand behind them and every component in them and make them right when we're at fault. We intend to do just that."

SPECIFICATIONS

B Tournapull

GENERAL OVER-ALL MEASUREMENTS

Length	40 ft 6 in.
Width	11 ft 8 in.
Height	12 ft 7 in.
Wheelbase	22 ft 11 in.

TIRES

Tournapull	2 (27.00x33) 30
Scraper	2 (27.00x33) 30

GAGE

(Width c to c of tires)	
Tournapull	9 ft 0 in.
Scraper	7 ft 2 in.

GROUND CLEARANCE

Tournapull	25 in.
Scraper	20 in.
Maximum Turning Angle	90° Left & Right
Turning Radius, Minimum	17 1/2 ft
Control	Electric
Brakes	Multiple Disk Air Brakes on all 4 Wheels
Shipping Weight, Lb	63,000
Empty Weight in Lb	
Front	42,000
Rear	21,000
Approx. Weight on Drive Axle Loaded	63,000

PRIME MOVER SPECIFICATIONS

Engine	Cummins NHRBIS 600 6-Cyl 293 hp @ 2,000 rpm
Transmission	Fuller 5 F1200 with LeTourneau - Westinghouse Transfer Case
Differential	Tournamatic, Torque-Proportioning
Steering	90° Turn Positive Electric Power Steer

SPEED in mph @ 2,000 rpm

	RANGE	
	Low	High
1st	2.00	2.90
2nd	3.99	5.78
3rd	7.70	11.16
4th	13.36	19.41
5th	16.41	23.74
1st Reverse		2.00
2nd Reverse		2.91

CAPACITIES

Cooling System	21 gal
Crankcase	12 gal
Fuel Tank	145 gal
Main Case	70 gal
Transmission	4 gal
Gear Boxes	4 gal

SCRAPER SPECIFICATIONS

CAPACITY	
Cu Yd (Heaped)	23
Cu Yd (Struck)	17.8



Steel Flooring Replaces Worn Planks on Rural Connecticut Bridge

When the plank flooring of this bridge near Seymour, Conn., needed replacing, the bridge was stripped to the stringers, repairs were made, and

a new deck of Bethlehem Formed Steel Bridge Flooring laid down. Result: a strong, smooth, rattle-proof bridge floor, requiring little or no maintenance.

Bethlehem Formed Steel Bridge Floor was easy to install. First, the worn planking was removed, then the Bridge Flooring was carried from the stockpile, where it nested compactly in small piles, to the bridge. After proper positioning, the 2-ft-wide corrugated steel plates were welded to the stringers, and adjacent plates welded together. In the case of wooden stringers, the steel floor is easily attached with lag screws and washers.

After a surfacing material was ap-

plied, the new bridge floor met all strength specifications of the American Association of State Highway Officials' standard specifications for highway bridges.

For complete information on Bethlehem Formed Steel Bridge Flooring write or phone the nearest Bethlehem sales office.

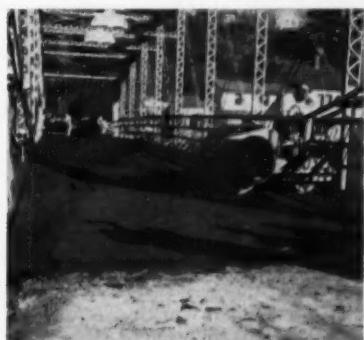
BETHLEHEM STEEL COMPANY

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation, Export Distributor: Bethlehem Steel Export Corporation.



**BETHLEHEM
STEEL**



Rolling the surfacing material which covers the steel bridge floor.



FAST CLEANUP of excess material along new highway shoulder for Hendrickson Bros., Valley Stream, N. Y. Quick reversing aids 2½-yd. 4-wheel-drive Model 175A Michigan.



MANHOLE TOPS AND COVERS are loaded aboard Horn Construction Co. (Merrick, N. Y.) trailer, then Model 125A pulls trailer and lowers materials into place on electric duct line.



ROCK MOVING by 1-yd Model 75A for Marshall C. Rardin Construction Co., Akron, Ohio. When operator applies brake and "guns" the engine, it accelerates bucket operation.

Clark Features Power Train In Shovels

TRACTOR SHOVELS on rubber are so versatile that construction jobs without one are few and far between. Already there are many manufacturers in this busy field—many of them adding "front-end loaders" to their other lines of construction equipment.

To the unpracticed eye, tractor shovels may look pretty much alike. But Clark Equipment Co., Benton Harbor, Mich., maker of the well-known line of Michigan power shovels and cranes, points particularly to the special power train designed for its Michigan tractor shovels as being of great advantage.

Clark introduced a line of six rubber-mounted tractor shovels about a year ago, ranging in capacity from 15 cu ft to 2½ yd, and with various combinations of steering and two-wheel and four-wheel drive.

A two-stage Clark torque converter couples the engine (Waukesha, gas or diesel optional) to a "power-shift" transmission. When the operator moves the shift-levers on the steering column, oil under pressure operates clutches that transmit power from forward or reverse and high or low drive gears to the output shaft. This oil is pumped through a cooling system, then returned to the transmission at the top, flowing downward into the sump and lubricating gears and bearings as it goes.

Planetary Gears

Drive axles incorporate heavy-duty planetary gears in the wheel hub. Michigans also have power-steering and bucket-position indicators.

There are two speed ranges for working and travel selected manually, with the same forward and reverse speed in each. A high and low in each range and forward or reverse are selected by the operator by moving a small lever on the steering column. A similar lever selects forward and reverse with the flip of a finger. Speeds range from 4 to 8 mph in working range and from 13 to 26 mph in travel position.

First in the field!

New Gardner-Denver 4½" Wagon Drill

new

4½" hammer diameter for
heavy-duty rock work.

new

drilling capacity for
handling larger rock bits.

new

drilling power for
deep hole drilling.

The new WRM123 heavy-duty Wagon Drill combines the new 4½" Drill, Ring Seal Shank, Sectional Drill Rods, and hydraulic power lifts for positioning the mast. Handles 10- to 12-foot steel changes. Write for additional specifications on Model WRM123.

The new
Gardner-Denver

WRM123

4½" Wagon Drill



SINCE 1859

GARDNER-DENVER



THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS
FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada) Ltd., 14 Curity Avenue, Toronto 16, Ontario

CONCRETE MIXING AND PLACING

By G. B. SOUTHWORTH*

A STRENGTH SPECIFICATION for concrete may seem to place an extra responsibility on the contractor, and may be resisted by some. But most "prescriptions" also contain a definite strength requirement which is enforceable and which, because of the restrictive proportions, may sometimes be rather expensive to meet. By using a different aggregate, a revised sand-aggregate ratio, or other skilled handling of the design, a concrete technician often can improve the strength or other properties of concrete without increasing its cost.

Selection of aggregates and proportioning of materials must comply with specifications. The modern specification which simply states the concrete requirements in terms of performance, slump, air content, maximum size of aggregate, and minimum compressive or, if important, flexural strength, allows the contractor some latitude in choice of materials and proportions.

Such specifications insure that the minimum needs of the job will be met, and, in most cases, because more intelligent design and control are used, the concrete is improved and the cost is lower. More and more engineers are becoming convinced that their clients' best interests are served by placing direct responsibility for concrete with the manufacturer of the concrete.

It is always a good idea when bidding a job to know something about the aggregates and cement economically available at the job site. If the contractor intends to use ready-mixed concrete, the concrete supplier will be able to advise him on costs of mixes specified. Where the contractor intends

TABLE 1 . . . Recommended Slumps for Various Types of Construction*

Types of construction	Slump, in.†	
	Maximum	Minimum
Reinforced foundation walls and footings	5	2
Plain footings, caissons, and substructure walls	4	1
Slabs, beams, and reinforced walls	6	3
Building columns	6	3
Pavements	3	2
Heavy mass construction	3	1

*Adapted from Table 4 of the 1940 Joint Committee on Recommended Practice and Standard Specifications for Concrete and Reinforced Concrete.

†When high-frequency vibrators are used, the values given should be reduced about one-third.

TABLE 2 . . . Maximum Sizes of Aggregate Recommended for Various Types of Construction

Minimum dimension of section, in.	Maximum size of aggregate,* in.			
	Reinforced walls, beams, and columns	Unreinforced walls	Heavily reinforced slabs	Lightly reinforced or unreinforced slabs
2½-5	½-¾	¾	¾-1	¾-1½
6-11	¾-1½	1½	1½	1½-3
12-29	1½-3	3	1½-3	3
30 or more	1½-3	6	1½-3	3-6

*Based on square openings.

TABLE 3 . . . Compressive Strength of Concrete for Various Water-Cement Ratios*

Water-cement ratio, gal. per bag of cement	Probable compressive strength at 28 days, psi	
	Non-air-entrained concrete	Air-entrained concrete
4	6000	4800
5	5000	4000
6	4000	3200
7	3200	2600
8	2500	2000
9	2000	1600

*These average strengths are for concretes containing not more than the percentages of entrained and/or entrapped air shown in Table 4. For a constant water-cement ratio, the strength of the concrete is reduced as the air content is increased. For air contents higher than those listed in Table 4, the strengths will be proportionally less than those listed in this table.

Strengths are based on 6 x 12-in. cylinders moist-cured under standard conditions for 28 days. See Standard Method for Making and Curing Concrete Compression and Flexure Test Specimens in the Field (ASTM Designation C 31).

to mix his own concrete, and where he has not had sufficient experience with the materials, he will usually find that obtaining the advice of a competent testing laboratory is a worth-while investment.

Quality Concrete

- The proportion specification often is either mis-read or misunderstood. "Not less than 6 sacks of cement and not more than 6 gal

*G. B. Southworth is assistant general sales manager for the Master Builders Company, Subsidiary of American-Marietta Company, Cleveland. He is in charge of field engineering services for his firm and chief instructor at the Master Builders annual concrete schools. In his long field experience he has designed thousands of concrete mixes using all types of aggregates.

11. Design and Control of Concrete Mixes

TABLE 4 . . . Approximate Mixing Water Requirements for Different Slumps and Maximum Sizes of Aggregates*

Slump, in.	Water, gal. per cu yd of concrete for indicated maximum sizes of aggregate							
	3/8 in.	1/2 in.	3/4 in.	1 in.	1 1/2 in.	2 in.	3 in.	6 in.
Non-air-entrained concrete								
1 to 2	42	40	37	36	33	31	29	25
3 to 4	46	44	41	39	36	34	32	28
6 to 7	49	46	43	41	38	36	34	30
Approximate amount of entrapped air in non-air-entrained concrete, percent	3	2.5	2	1.5	1	0.5	0.3	0.2
Air-entrained concrete								
1 to 2	37	36	33	31	29	27	25	22
3 to 4	41	39	36	34	32	30	28	24
6 to 7	43	41	38	36	34	32	30	26
Recommended average total air content, percent	8	7	6	5	4.5	4	3.5	3

*These quantities of mixing water are for use in computing cement factors for trial batches. They are maxima for reasonably well-shaped angular coarse aggregates graded within limits of accepted specifications.

If more water is required than shown, the cement factor, estimated from these quantities, should be increased to maintain desired water-cement ratio, except as otherwise indicated by laboratory tests for strength.

If less water is required than shown, the cement factor, estimated from these quantities, should not be decreased except as indicated by laboratory tests for strength.

TABLE 5 . . . Volumes of Coarse Aggregate per Unit of Volume of Concrete*

Maximum size of aggregate, in.	Volume of dry-rodded coarse aggregate per unit volume of concrete for different fineness moduli of sand			
	2.40	2.60	2.80	3.00
3/8	0.46	0.44	0.42	0.40
1/2	0.55	0.53	0.51	0.49
3/4	0.65	0.63	0.61	0.59
1	0.70	0.68	0.66	0.64
1 1/2	0.76	0.74	0.72	0.70
2	0.79	0.77	0.75	0.73
3	0.84	0.82	0.80	0.78
6	0.90	0.88	0.86	0.84

*Volumes are based on aggregates in dry-rodded condition as described in Standard Method of Test for Unit Weight of Aggregate (ASTM Designation C 29).

These volumes are selected from empirical relationships to produce concrete with a degree of workability suitable for usual reinforced construction. For less workable concrete such as required for concrete pavement construction they may be increased about 10 percent.

of water," is construed to mean, "Not more than 6 sacks of cement and not less than 6 gal of water." The engineer also may have stated that his strength requirements are 4,000 psi at 28 days. Many con-

tractors, estimating on such a job, automatically figure the price of concrete containing 6 sacks of cement per yd, rather than the price of a 4,000-lb mix.

The successful bidder occasion-

ally arrives at the job to find that the slump he needs and the local aggregates have combined to require a total of 42 gal of water per yd of concrete instead of the 36 gal indicated by the specification. And so, to meet the "not more than 6 gal" as well as the 4,000 psi, 7 sacks of cement are required, and the concrete cost is increased by about \$1 per yd.

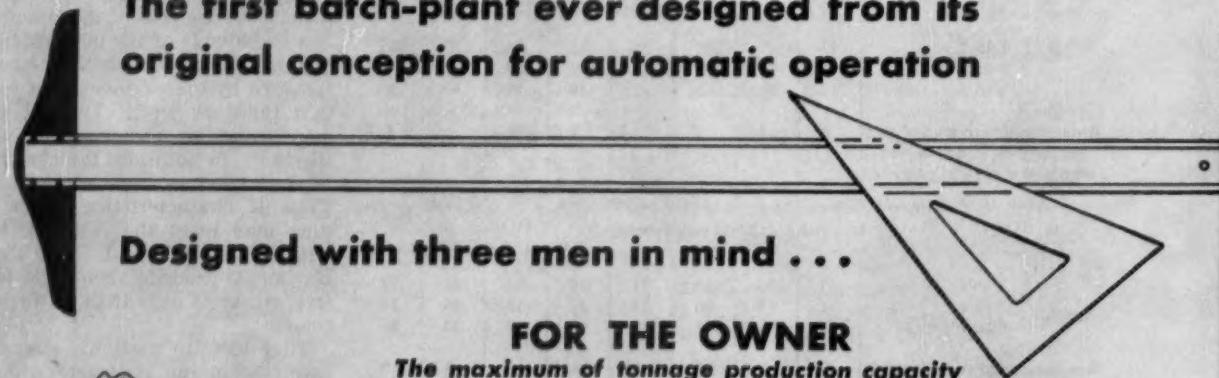
Equally necessary in accurately estimating the cost of the concrete is a knowledge of the performance of the local cement or the cement specified by the engineer. For certain types of work, Type II cement may be indicated by the specifier. In addition, the cements produced in certain areas have Type II characteristics, although they may meet the A.S.T.M. requirements for Type I. Some Type II cements produce about 20% less strength at 28 days than do Type I cements.

Therefore, to meet his strength specification, our contractor would have to adjust the water-cement ratio to provide for the lower 28-day strength of Type II cement. To do this, he would use not more than 5 gal of water per sack of cement (water-cement ratio for 5,000-lb concrete with Type I cement).

- A capable concrete technician, working for the contractor, can be of service to his employer, the engineer, and the owner in cases where the use of Type II cement, for its modified heat of hydration and increased resistance to corrosion is specified. Assuming that the 36 gal of water inferred by the "not less than 6 sacks of cement and not more than 6 gal of water" was correct, it should be pointed out to the engineer that Type II cement may not produce 4,000-lb concrete at 28 days with only 6 sacks; that a water-cement ratio of 5 gal per sack may be required—which means that a cement factor of 7.2 sacks per yd will be needed to produce 4,000 psi at 28 days. This increase in cement factor, which will increase the heat of hydration and tend to promote cracking and crazing due to the richness of the paste, will defeat (at least in part) the purpose of the Type II cement. The alternatives are to settle for a reduced 28-day-strength or to (Continued on page 106)

introducing the Barber-Greene

The first batch-plant ever designed from its original conception for automatic operation



Designed with three men in mind . . .



FOR THE OWNER

The maximum of tonnage production capacity

ALL SIZES OF AGGREGATE, INCLUDING THE MINERAL FILLER, ARE WEIGHED SIMULTANEOUSLY. Total weighing time for all ingredients is considerably less than the shortest mixing time in any specification. The only limit on hourly production is the specified mixing time. The completely new pugmill principle gives thorough coating in less time than any other pugmill manufactured today. When a minimum mixing time is not specified, complete coating can be obtained and the tonnage output in-

creased to far above the production of plants of comparable pugmill capacity. Virtually no time lost in discharging. Full-opening bottom gives instantaneous discharge without segregation.

The maximum of flexibility

The plant may be "preset" for all-day production of the same mix in repetitive cycles, and instantly switched for a new mix for the "drive-in" customer. Sooner than the next truck can drive under, the plant is back to its preset proportions and in repetitive cycle operation again.



FOR THE OPERATOR

A new ease and simplicity of operation

Automatic Operation. With the proportions preset, the operator locks in the "cycle" button when a truck drives under. The plant then automatically goes through complete cycles, including discharging to the truck. If he merely pushes the automatic button (without locking it), the plant goes through the complete cycle up to the point of discharging.

Manual Operation. For individual loads or other "drive-in" trade, the operator instantly disengages the preset combinations and weighs

out each size of aggregate in ordinary batch-plant fashion. Operating one valve resets the preset proportions.

Using preset proportions, the operator can manually weigh the materials by either operating one valve to **WEIGH ALL SIZES SIMULTANEOUSLY**, or operating the individual bin valves to weigh each size separately. In either of these cases, no skill or judgment is required for accuracy. The preset combinations control the proper weight.



FOR THE INSPECTOR

At any time, the inspector can quickly check the weight of the asphalt, the weight of each size of aggregate, the weight of the mineral filler, or the weight of the total aggregate.

The plant automatically extracts a true cross-sectional sample of the aggregate in each bin

as part of its regular operating cycle. Normally this sample is fed into the next batch, but at any time the inspector can remove this sample for a gradation check. The plant can be set so that the cycle will be interrupted if there is any variation from the preset proportions.

BITUMINOUS Batch Plant

890 series



Automatic Controls

The electric controls are simple 110-volt A.C. circuits. There are no electronic devices. The automatic measuring itself is not dependent on the electrical controls. If for any reason the operator wishes or needs to operate without the electrical controls, he may do so, and no skill or judgment is required.

Here is the most revolutionary development in the field of bituminous paving since Barber-Greene introduced the continuous plant over a quarter century ago.

When continuous type? When batch type?

The superior performance of the new Barber-Greene Batch-Plant is *not* reason for switching to batch-plants in applications where a continuous-type plant will serve.

No batch-plant, not even the new Barber-Greene, can compete with the continuous plant for highway work, or any application where high tonnage production and portability are important factors.

The basic advantages of the continuous principle continue to exist, and the continuous plant should and will continue to be the most popular.

However, where the batch principle is preferred, primarily for the purpose of serving frequent "drive-in" trade, requiring different mixes during the day, Barber-Greene now offers the outstanding batch-plant of the field.

For years, Barber-Greene has produced more asphalt plants than all others combined. We continue to offer the most comprehensive line of bituminous equipment of any manufacturer.

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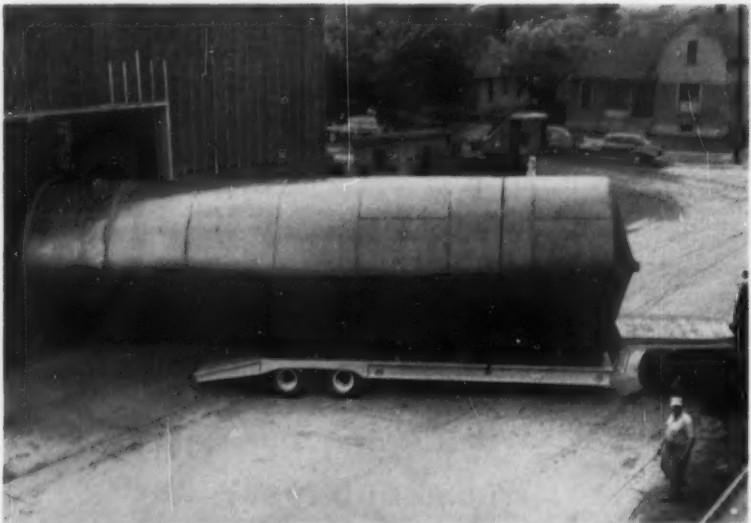
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Trailer Model	LaCrosse DF6T 20-Ton Drop	Mfr. A 20-Ton Drop	Mfr. B 20-Ton Drop	Mfr. C 20-Ton Drop
Gross Weight	8000 lbs.	9500 lbs.	9850 lbs.	10,000 lbs.

Up to 38% lower trailer cost

Trailer Model	LaCrosse DF6T 20-Ton Drop	Mfr. A 20-Ton Drop	Mfr. B 20-Ton Drop	Mfr. C 20-Ton Drop
List Price FOB Factory	—	38% more*	35% more*	36% more*

*Based on latest available published prices.

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free service. Best of all, LaCrosse's increased trailer volume and advanced modern facilities make it possible to give you the strongest, best-built trailer on the market — at savings up to 38% in first cost. Wide choice of models — from 6 to 75-ton capacity — with flat, drop or tilting platforms. Write for FREE descriptive literature. LaCrosse Trailer Corp., Gould St., LaCrosse, Wis.

LC-32

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America's Favorite LOW-BED TRAILER

CONCRETE . . .

Continued from page 103

cure the concrete for 60 days instead of 28 days. Type II cement at 60 days should equal the strength of Type I at 28 days.

- **Air entrainment** may forcefully call attention to the fact that the amount of cement specified in the "prescription" type of specification is a minimum and not a maximum. Entrained air in the richer mixes, 3,000 lb compressive strength and up, can be quite expensive. Its effect on compressive strength will depend, to a great extent, on the aggregates, especially the sand. Again, a knowledge of local materials is almost mandatory. And again, the manipulation of the mix design by the technician under a non-restrictive specification can provide the highest quality of concrete without undue cost increase. More will be said about air entrainment later.

Engineers deal in facts. A complete working knowledge of the materials to be used will permit the contractor to furnish evidence to the engineer that his specification can be improved by more efficient use of the ingredients of the concrete, or by minor changes in some of the restrictions. Properly presented, and properly documented, such evidence often convinces the engineer that his clients' interests are furthered by a modification in the concrete specification.

- **Coarse aggregate** probably is the most important component of concrete. Good sound coarse aggregate is absolutely essential in the production of high quality concrete. Common methods of concrete design are based on the assumption that good coarse aggregate is available. If the coarse aggregate is known to be of poor quality, unorthodox steps such as grossly over-sanding the mix, with attendant high cement paste requirements, may be the only way in which the specified strength may be obtained.

When good coarse aggregate is available, the best concrete is produced by using the largest size of aggregate and the greatest quantity per yd of concrete that is compatible with job requirements. A simple rule for determining the top size of aggregate is that the diameter of the largest pieces shall be not more than one-fifth of the minimum dimensions of the concrete section, nor more than three-fourths of the minimum clear



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CONCRETE ... Continued

spacing between forms and/or re-inforcing.

A good guide for determining correct size of aggregates, as well as the correct slump of concrete for various conditions of placement, is contained in the "Recommended Practice for Selecting Proportions for Concrete" of the American Concrete Institute—given here in Table 1 and Table 2.

Even when the coarse aggregate is relatively sound, some deviation from above recommendations or from the job specifications may be desirable under certain conditions, particularly when flexural strength is included in performance requirements. The surface of coarse aggregate, especially if gravel is being used, may not provide a good bond for the mortar. While gravel aggregates usually produce quite satisfactory compressive strengths because of the better mobility of the aggregate and the lower water demand per yd of concrete, large gravel in concrete designed for flexural strength may be a decided handicap if the surface is smooth, since a substantial part of the beam cross-section will be composed of aggregate surfaces with which the cement paste and the mortar has little opportunity to bond. Better flexural strengths with little or no increase in cement content can be obtained by using smaller sizes, the surfaces of which are more likely to be crushed or irregular.

• **Fine aggregate**, sand or concrete grit, as it is called in some localities, is the second material in order of importance to the production of good concrete. It is almost universally true that sand will be the source of more difficulties and may have a greater effect on the strength and durability of concrete than coarse aggregates. However, there are remedial methods we can use to overcome deficiencies in sand.

Fine fillers can be added to offset a lack of fines; air entrainment can be employed to reduce some of the disadvantages caused by poor gradation; proper proportioning of the aggregates will correct, at least partially, a lack of coarse particles in the sand; and occasionally it is possible to neutralize the effects of organics or other foreign matter in fine aggregates.

One of the quickest tests to determine the concrete-making ability of fine aggregate is to pick up (Continued on page 111)

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The Trowbridge Construction Company, Marshalltown, Iowa, is one of the thousands of contracting firms the country over that has discovered the fastest, most economical way to dig basements is with an INTERNATIONAL DROTT Skid-Shovel.

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You'll know what Terry is talking about when you call your INTERNATIONAL Industrial Power Distributor for your demonstration. There are four sizes of Skid-Shovels— $\frac{1}{2}$, $1\frac{1}{4}$, 2 and 3 cu. yds.—and they all have Skid-Shoes and use pry-out action to supply 300% greater break-out force. Loading force is transmitted into the ground and the units transport heaped loads at ground level in high gear to speed every cycle. Call today for your demonstration and see how they'll cut your excavation costs.



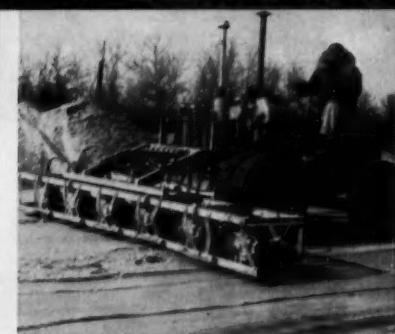
FULL HEAPED LOAD is retained during transport and dumped on the stock pile without spillage. The highest lift, farthest pitch feature pays off big for loading out haul trucks with high bodies.



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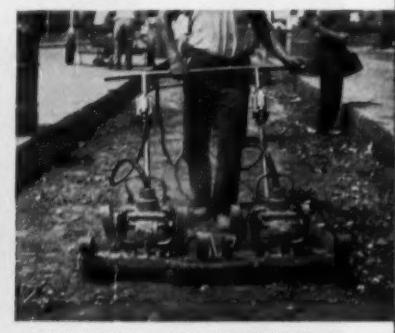
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PAVEMENT WIDENING. The Multiple Compactor can be quickly converted to provide in ONE PASS 100% of required density in granular soil sub-bases and rock courses in any widening project.

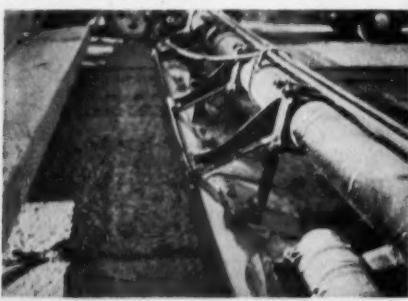
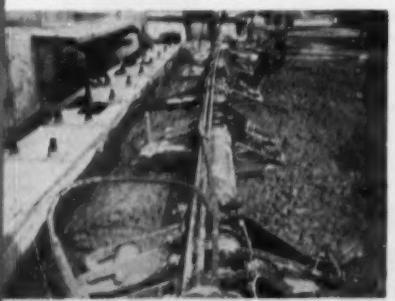
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BLACKTOP WIDENING & PATCHING. The same machine operated from power plant on auto-trailer with pickup for Compactor is most efficient means of blacktop pavement patching, paving walks, drives, etc. Will compact up to 2000 sq. ft. per hr. close to maximum density.

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CONCRETE VIBRATION FOR HIGHWAY AND AIRPORT PAVING

INTERNAL TYPE: super-powered, gives full width internal vibration through full depth of very thick slabs. Saves time, cement; provides greater density and compressive strength. Attaches to finisher or spreader.

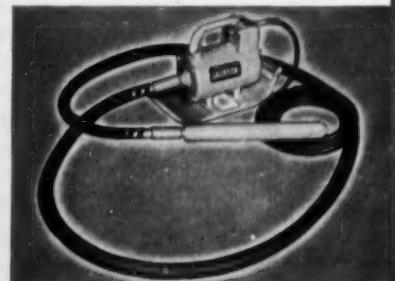
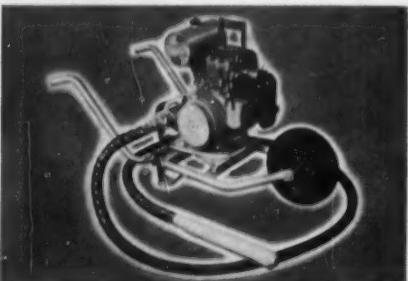
SURFACE TYPE: does perfect job of vibrating all mixes in depths used on highway projects. The owner of a JACKSON Paving Tube can quickly switch from internal to external vibration, or vice versa, at minimum expense.

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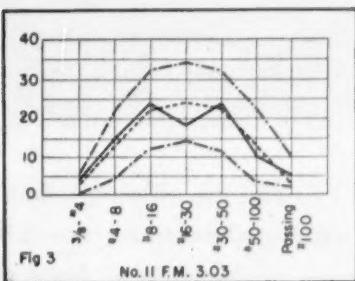
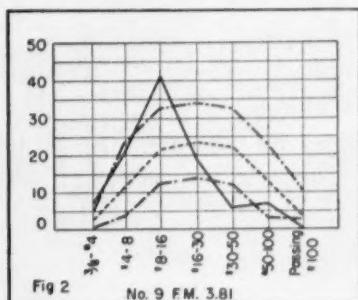
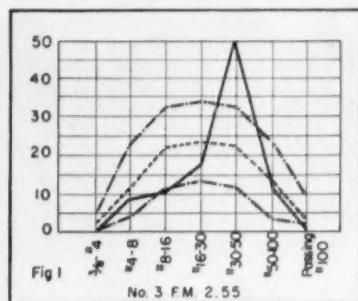


GENERAL CONSTRUCTION

(Left); 6 H.P. engine-driven, flexible shaft vibrator. Excellent for both thin and thick sections. (Right); 2½ H.P. electric vibrator (for light-socket operation). Handy as a pocket in a shirt, powerful enough to handle all general construction concrete vibration with shafts up to 20'.

CONCRETE ... Continued from page 108

a handful of damp sand from the stockpile. Squeeze it. If it bites into your hand, it is sharp and will have good bonding properties. Brush off your hand. If it is relatively clean, the sand does not contain an excess of silt and harmful fines. Clean, sharp sand makes the best concrete. Obviously, this test does not take the place of the tests made



by laboratories, but if the sand fails to meet the squeeze test, it will almost certainly fail in the laboratory.

A sieve analysis of the sand is necessary to arrive at the proper proportion of fine and coarse aggregate in the concrete. An examination of that analysis will also give the contractor several clues on the behavior of the resulting concrete in both the plastic and hardened states. For example, note the analysis of three sands in the charts: Figs. 1, 2 and 3.

The dotted line on these charts represents the ideal gradation of concrete sand; the dot-dash lines are the recommended maximum

deviation; and the solid line is the sieve analysis of the sand under test. No. 3 and No. 9 are extremes, but they are not impossible gradations. Sands like these exist and are used in concrete work every day. They are known as bleeders, meaning that the concrete will have excessive water gain. Bleeding of water to the surface, of itself, is not as harmful as it is inconvenient. It is the movement to the surface, with the water, of the light, weak fines in the mix that causes poor wear resistance and poor durability.

When the sieve analysis of the sand from the job shows peaks or valleys in its plotted line on this chart, it can be expected to produce concrete with unusual water gain and laitance, and to produce surfaces that dust readily and have little or no resistance to wear or weather. The use of air entrainment in one form or another is a definite advantage with such materials.

Sand No. 11, while coarse, is a much better material. It follows the ideal curve rather closely, and bleeding or water gain will be held to a minimum, even without air entrainment. This sand, used in conjunction with optimum air contents, will produce highly durable concrete, since bleeding will be almost eliminated.

Where the specifications call for air-entrained concrete, sieve analysis of the sand can also help the contractor anticipate the amount of air to expect, or the amount of air-entraining agent required to produce the desired air content. Entrainment of air in concrete appears to be affected most by that portion of the sand which passes the No. 16 sieve and is retained on the No. 50; in other words, the fractions retained on the No. 30 and No. 50 sieves.

Sand No. 3 has a total of 67% retained on those two sieves, as compared to about 45% on an ideal sand. Other factors being equal, it would be expected to entrain more air with a given amount of air-entraining agent, or, conversely, would require less agent for a given amount of air.

Concrete containing sand No. 9, which has only 25% on the No. 30 and No. 50 sieves, would entrain very little air with interground cement or with standard amounts of air-entraining agents. Since the contractor does not usually consider the air-entraining agent as adding anything to the cost of his concrete, he may well be surprised

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The DIESELPACK because of its engineered construction requires 2 to 4 quarts less oil than spongy substitute filter elements being offered for use in the Luber-finer housing. This is an additional saving enjoyed when using the DIESELPACK.

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CONCRETE ... Continued

to find that air has suddenly become rather costly.

Other factors also have a bearing on the percent of air entrained in concrete and must be considered as a part of the whole. The shape of the sand is important, angular sand entraining more air than rounded particles; the amount of material on the No. 100 sieve, which contributes to the "fattiness" of the mix and helps to hold in the concrete the air which is entrained; and the material passing the No. 100 which is very fine and acts as an air inhibitor in much the same way as additional cement or other fine additives.

Fine aggregate performs two major functions in the concrete; as an inexpensive filler of most of the voids that exist in even the best graded coarse aggregate; and as a lubricant, or roller bearings, for the coarse, to assist us in placing the larger material where we want it—uniformly distributed throughout the mass of the concrete.

The minimum quantity that will do both jobs well is the amount that should be used for best results. To use more increases the amount of surface area that must be coated with cement paste and, to achieve a given quality of concrete, will increase the cost.

• An average graded concrete sand has a surface area of approximately 1,900 sq ft for each 100 lb. An average graded 1½-in. aggregate has a surface area of about 70 sq ft per 100 lb. Where a sand aggregate ratio of 40% is used, 100 lb of combined aggregate has the following surface areas:

40 lb sand	760 sq ft
60 lb coarse	42 sq ft

Total area	802 sq ft
------------	-----------

Under pressure from the workmen, concessions in sand ratios are sometimes made. More often than we care to admit, the mix becomes 50% sand, and here is what has happened to our surface areas:

50 lb sand	950 sq ft
50 lb coarse	35 sq ft

Total area	985 sq ft
------------	-----------

This is an increase of almost 23% in the surface area of the aggregates, and unless we make a similar adjustment in the volume of both cement and water, we have either a diluted cement paste, or a

mix which contains uncoated aggregates, or both.

Good concrete is produced only when the entire surface of all the aggregates is coated with a thin layer of a strong cement paste.

• The cement paste probably is the most predictable of all our materials and will behave more closely to what we expect of it than the aggregates. Although experience the last few years may have caused some to doubt the validity of that statement, the fact remains that, except during the heaviest

construction seasons when everyone is working above capacity and when many factors can cause variations in results, a paste composed of definite amounts of water and cement produces, within reasonable limits, dependable strengths.

Some of the criticism of cement in recent years undoubtedly is because of the difference between air-entrained and non-air entrained concrete, and perhaps to the difference between brands of cement. That differences do exist between brands has been fairly well established. It is a perfectly



No clutter or confusion at paving site. Premixed concrete delivered by Dumpcretes ready for placing.

PAVING ON THE OHIO TURNPIKE

Non-agitated Hauling Meets Every Test

On sections C-2 and C-3 of the Ohio Turnpike there's no clutter at the paving site. No paver, no water trucks, no men to run them.

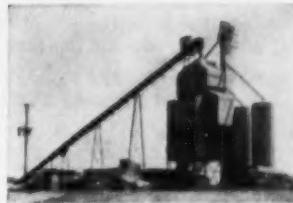
Just spreaders and finishers, plus a Dumpcrete or two discharging 4 yards of premixed concrete in 60 seconds.

The automatic central mixing plant is midway on the 10-mile job. Three men run it. 14 Dumpcretes haul its 95,000 yd. production.

Here's the bonus. The single plant supplies concrete for bridges, culverts, walls and widening as well as paving.

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Central mixing plant located midway on job.



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Other advantages of this outstanding instrument include coated optics, internal focusing and a ball-bearing race for smooth operation even in sub-zero weather. Check out a White on your next trip and discover how much easier your work can be. Write for DAVID WHITE Bulletin 1053 and name of nearest dealer, 343 W. Court St., Milwaukee 12, Wis.



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CONCRETE ... Continued

natural occurrence, since raw materials from the same source are seldom used by two different producers. But sharp local variations are the exception, rather than the rule.

Design of Mixes

- The local testing laboratory is the most reliable source of concrete mix designs. For a nominal fee, a complete set of mix proportions for various strengths and other properties desired on the job can be obtained. One distinct advantage of using the local laboratory is that its method of concrete proportioning is blended with a complete knowledge of the performance of the cement and aggregate to be used.

Unfortunately, laboratories specializing in concrete are not always available. Usually, the ready-mix concrete company can assist the contractor in arriving at the correct mix. Where a local ready-mix market operates on a sack basis, or where job-mixed concrete will be used, the contractor with a strength specification is required to design his own concrete.

Although there are several satisfactory methods of preparing paper designs of concrete, the one that is likely to require the least adjustment in the field, and the one that lends itself most readily to day-to-day control is the "Recommended Practice for Selecting Proportions for Concrete (ACI 613-54)." This method has been approved by the American Concrete Institute and was published in its Journal for September, 1954. It is a combination of the best features of the earlier "ACI Standard Recommended Practice for the Design of Concrete Mixes (ACI 613-44)" and "A Method of Proportioning Concrete for Strength, Workability and Durability" by A. T. Goldbeck and J. E. Gray of the National Crushed Stone Association. (Copies of the complete paper can be obtained from the American Concrete Institute, 18263 West McNichols Road, Detroit 19, Mich.)

Data Required for Design

To reduce field adjustments to a minimum, accurate analyses of the aggregates are needed. These include the specific gravities of both the fine and coarse aggregates, the sieve analysis of the fine aggregate, and the dry rodded weight of the coarse aggregate. Sieve analysis of the coarse aggregate is of no par-

ticular advantage in the A.C.I. design method unless it is necessary to determine the correct top size of the material. Information on aggregates often can be obtained from the state highway department when there are no laboratories in the vicinity of the job. In any event, the above data can be obtained by simple tests.

- Specific gravity is simply a term used to define the solid weight of a material in relation to the weight of water. A specific gravity of 2.5 means that the material in question, in a solid state, weighs $2\frac{1}{2}$ times the weight of water which is generally accepted as 62.4 lb per cu ft.

It is preferred that aggregates be tested in a saturated surface-dry (SSD) condition. Since most aggregates are used in a damp or wet state, the use of a specific gravity on SSD material eliminates the need for considering absorption of the aggregate and correcting for it in the design weights. Water contained in aggregates has little or no effect on strength or other properties of the concrete; but water carried on the aggregates affects workability of the mix and, if not compensated for, strength and other properties will be impaired.

By using a SSD specific gravity, the only adjustment required in the field will be to compensate for surface moisture on the aggregate. Arriving at the SSD state is not particularly difficult. The material to be tested is spread on a clean surface and allowed to air dry. Either fine or coarse aggregate will appear darker when it is damp. As the color starts to change from dark to light, it can be assumed that the aggregate is saturated, but surface dry.

While several methods can be used, the specific gravity test essentially is a measurement of the displacement of water by a known weight of aggregate. A siphon can (Fig. 4, p. 117) is one method. One thousand grams of aggregate are placed in the can, and the displaced water is weighed. The weight of the aggregate divided by the weight of the displaced water is the specific gravity of the material. (Technical Bulletin No. 11, published by the Master Builders Co., Cleveland, Ohio, gives the details of this method of moisture determination).

- Fineness modulus (FM) is an index of the lubricating value of the

(Continued on page 117)



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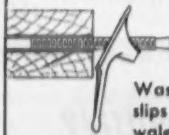


HANDLE WASHER



NUT WASHER

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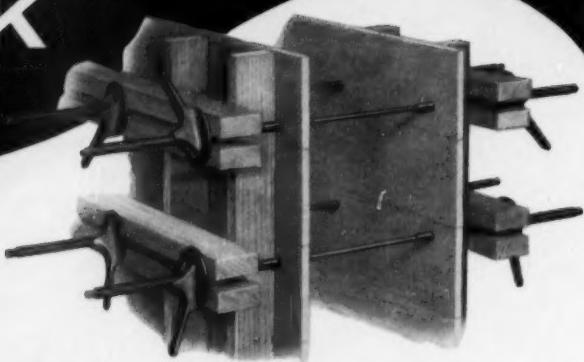


Washer, in tilted position quickly slips over stud rod threads to wale and is seated.



Three full turns on the threads of the outside rod bring it flush and tight against the wale. When pointing upward, the handle may be hit accidentally or pressure released during pouring. This may cause the handle to turn 180°, but the safety feature of 3 complete turns makes it impossible for the clamp to fall off the thread.

Tilt Lock Clamp Assemblies may be rented with a ninety day option to purchase.



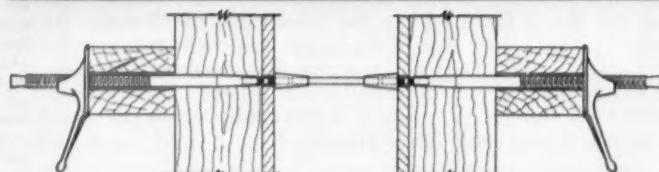
The "safety in use" of Superior's Handle and Nut Washers for Tilt Lock Clamps is shown at the left. The Tilt Lock Outside (Stud) Rods have outstanding features, too. The Outside Rod has $\frac{1}{4}$ " threads, five to the inch, rolled on a $\frac{3}{4}$ " high carbon rod. This compares with the $\frac{3}{8}$ " thread cut on a $\frac{3}{4}$ " rod usually supplied. Cold rolled threads are tougher, and therefore more resistant to damage, and their contour greatly reduces the clogging of concrete and facilitates cleaning.

The Tilt Lock Outside Rod has a heavy cold forged rectangular end section that is $\frac{3}{4}$ " wide and $\frac{1}{2}$ " thick, to which the Handle Washer is applied as a removal wrench. This forged section is practically indestructible, never becomes rounded after numerous reuses as does a milled end. Therefore, it is never necessary to use a Stillson.

Superior Tilt Lock Clamps are supplied with Outside Rods 16" long and 20" long, for both $\frac{3}{8}$ " and $\frac{1}{2}$ " inside tie rods. Extensions are available where field conditions require Outside Rods longer than 20".

Superior supplies high tensile inside rods with rolled threads. Form layouts and estimates are prepared from plans without charge or obligation.

with Cone Nuts for Spreader Action



Where it is desirable to use Tilt Locks with Superior Cone Nuts for spreader action or other reasons, Tilt Lock Rods are adapted for use with Cone Nuts as illustrated above.

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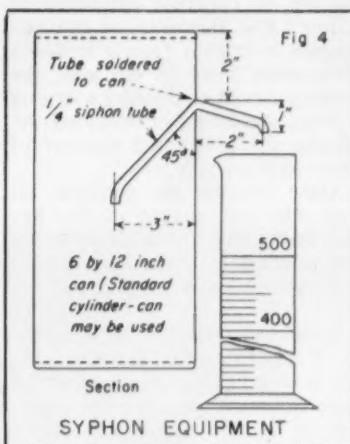
New York Office

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Pacific Coast Plant

2100 Williams St., San Leandro, Calif.

CONCRETE . . .
Continued from page 114



sand in the same way that an S.A.E. number is the index of the lubricating value of a motor oil. The lower the FM, the greater the lubricating value; less sand and more coarse aggregate can be used in workable mixes. The big disadvantage of low FM's, although the fine sands may have an advantage in that larger quantities of coarse aggregate can be used, lies in the fact that the FM is inversely an index of surface areas. In other words, the sands with a low fineness modulus, indicating a preponderance of fines, have extremely large surface areas which must be coated with water and cement to make good concrete.

To arrive at the fineness modulus of a sand, its sieve analysis is converted to an accumulated retained percentage for the series of sieves (% in., Nos. 4, 8, 16, 30, 50, 100 and pan must be used). The accumulated percentages are then totaled and divided by 100. The result is the FM of the material. The material retained in the pan is not considered since that actually is a passing percentage. Excessive amounts in the finer screens or passing the 100-mesh sieve therefore tend to provide a low FM.

- For the dry rodded weight of the coarse aggregate, the material again should be in a SSD condition. The container used should be at least $\frac{1}{2}$ cu ft in volume. If the top size of the aggregate exceeds 2 in., a 1-cu ft container will be more accurate.

The container is filled in three layers, and each layer is packed to reduce voids to a minimum. This packing or rodding is customarily done with a standard bullet-pointed rod such as is used in the



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CONCRETE . . . Continued

making of concrete cylinders or slump tests. However, if the aggregate is friable (easily broken) or exceeds 2 in. in top size, the packing should be done by a jiggling process, consisting of dropping the container a prescribed number of times on each side.

After striking the contents off level, the net weight of the aggregate is determined and the result calculated to a weight per cu ft for the coarse material.

• To demonstrate the A.C.I. method of design and to illustrate the use of aggregate data, assume we have obtained preliminary information on the aggregates to be used for job-mixed concrete on a large factory building. A crushed limestone aggregate is to be used as the coarse and natural sand as the fine.

In the specific gravity test, 1,000 grams of the limestone displaces 357 grams of water. The specific gravity of the limestone is 1.000 divided by 357 or 2.80. The solid weight per cu ft, absolute volume, is 2.80 times 62.4 or close to 175 lb. A 1,000-gram sample of the sand displaces 377 grams of water; the specific gravity is 2.65; and the solid weight is slightly more than 165 lb per cu ft, absolute volume.

The sieve analysis of the fine aggregate may be given in individual percentage retained, percentage passing, or in accumulated percent retained. But the accumulated percent retained is used in determining fineness modulus. Either of the others can be easily converted to an accumulated percentage. For example:

Sieve	Individual Percent Ret.	Percent Passing	Accumulated Percent Ret.
3/8-in.	0	100	0
No. 4	2	98	2
8	13	85	15
16	22	63	37
30	23	40	60
50	22	18	82
100	14	4	96
Pan	4		

Fineness modulus is determined by dividing the total of the accumulated retained percentage by 100. In the above case, the total is 292; divided by 100, the FM is 2.92. This is a definite index of the ability of the sand to lubricate a mix and carry coarse aggregate into place.

Our limestone coarse aggregate, which has been identified as 1½



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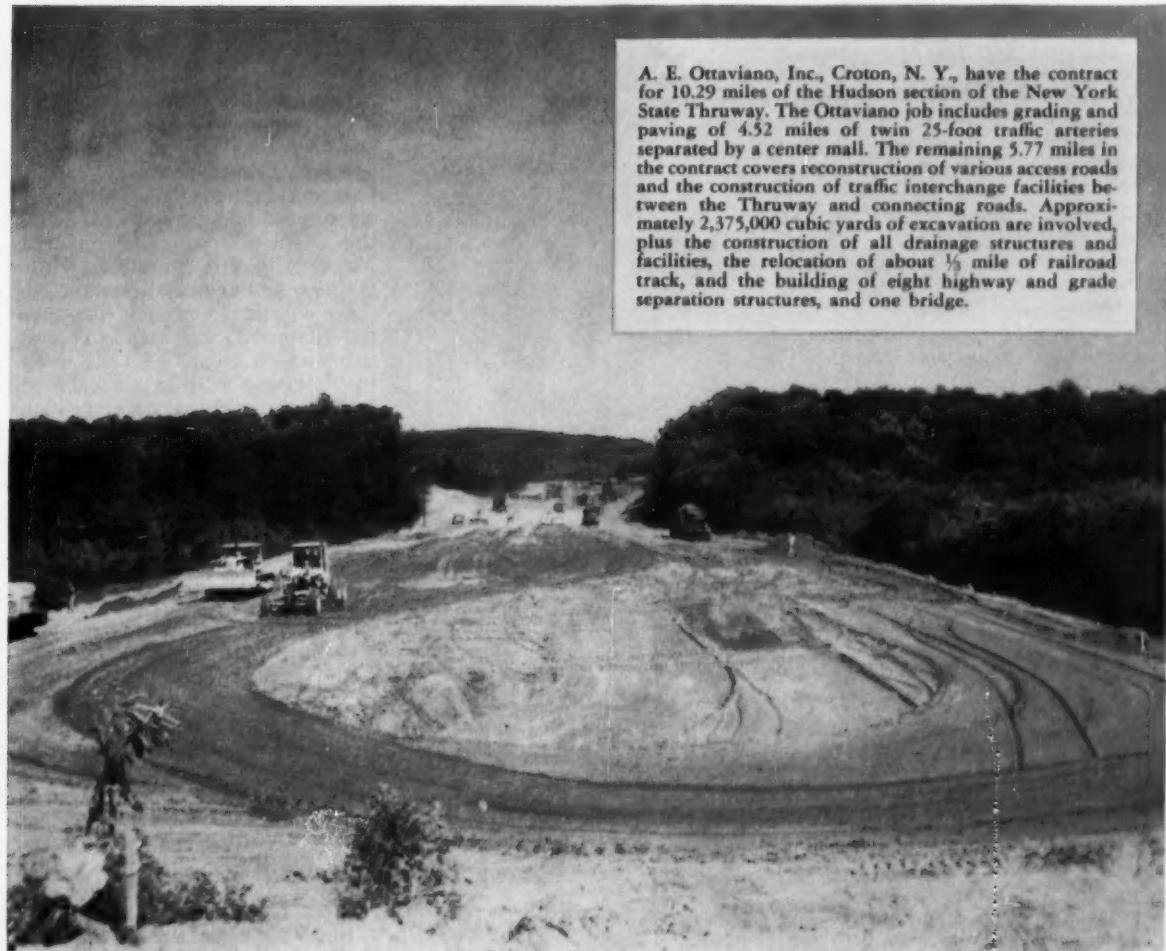
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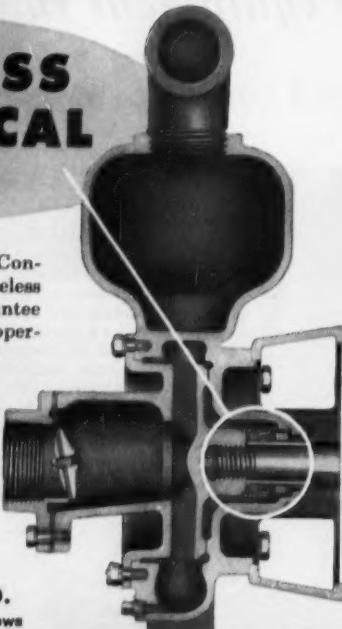
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CONCRETE . . . Continued

in. top size, has a dry rodded weight of 105 lb per cu ft. Since the specific gravity indicates that a solid cu ft of aggregate would weigh 175 lb, it follows that the solid volume of the aggregate in a dry rodded cubic foot is .6 of a cu ft (105 lb divided by 175 lb). Incidentally, this also indicates a void content of 40% in the aggregate.

Concrete Requirements

Our mythical factory has a large concrete floor area for which the engineer has specified 4,000-lb concrete. There are no special exposure requirements involved, so we need be concerned only with the water-cement ratio required for the strength specified. While the floor will be heavily reinforced, there will be a minimum clearance between reinforcing bars of at least 2 in. which means that our 1½-in. limestone will be satisfactory. In fact, the engineer's specification reads:

"Concrete for manufacturing areas shall have a minimum compressive strength at 28 days of 4,000 psi. Slump shall not exceed 4 in., and crushed aggregate of 1½ in. maximum size shall be employed."

- Cement paste quality with good sound aggregates is the only factor which will influence the strength of our concrete. Without previous experience or advance information on performance of the cement, we will have to assume that it is at least average. On that basis, we will proportion our cement paste on a standard water-cement ratio—Table 3. (Table 5 in the A.C.I.'s new method.)

Since the conditions of this particular concrete are such that air entrainment is not required, and may even be detrimental, non-air-entrained concrete will be used and our water-cement ratio for a paste that will develop 4,000 lb compressive strength at 28 days is 6 gal per sack of cement (94 lb.).

- Water requirements to be hoped for are at least average. Table 4 (A.C.I.'s Table 3) gives us a good starting point in working our paper design. To the extent that our aggregates are better or worse than average, field adjustments will have to be made. For example, if rounded gravel were being used, water requirements



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CONCRETE ... Continued

would probably be reduced by 3 to 5 gal per yd.

In our paper design, for 1½-in. crushed aggregate and a 4 in. slump, we use 36 gal of water. Since our strength requirements indicate that one sack of cement will be needed for each 6 gal of water, our cement factor will be 6 sacks per cu yd or 564 lb. We also note in Table 3 that we can expect about 1% entrapped air.

• **Volume of paste** needed depends upon several factors. Production of concrete is an involved process of filling voids that exist in materials. The coarse aggregate, if used alone, would have a minimum of 40% voids. Sand is used not only to lubricate the coarse and help place it but also to fill the major part of the voids that exist in the coarse. Cement and water act not only as a glue, but also serve to fill the remaining voids. In order to arrive at a cu yd of concrete, it is required to determine the absolute, or solid, volume of the ingredients.

For design calculations, we consider that 7½ gal of water have a volume of 1 cu ft. The total volume of the water in our design is 36 gal divided by 7½ gal, or 4.80 cu ft.

Although a sack of cement is sometimes referred to as a cu ft, its solid volume is considerably less than 1 cu ft. The specific gravity of cement is approximately 3.15 or 196.56 lb. per solid cu ft. A sack, which weighs 94 lb., has a solid or absolute volume of only .478 of a cu ft (94 divided by 196.56). Six sacks of cement, in our design, will actually contribute 6 times .478 or 2.87 cu ft to the yield of our mix.

With entrapped air of 1% (.27 cu ft) the paste content of our mix will be:

6 sacks of cement	2.87 cu ft
36 gal of water	4.80 cu ft
1% entrapped air	.27 cu ft
<hr/>	
7.94 cu ft	

The balance of the cu yd, or 19.06 cu ft, will be a combination of coarse and fine aggregate. Before the day of the concrete technician, the combining of these materials was either pure guesswork or a long and tedious process of trial and error. While the paper design may require some field adjustment for optimum results, the first effort is still good, usable concrete.

(Continued on page 124)



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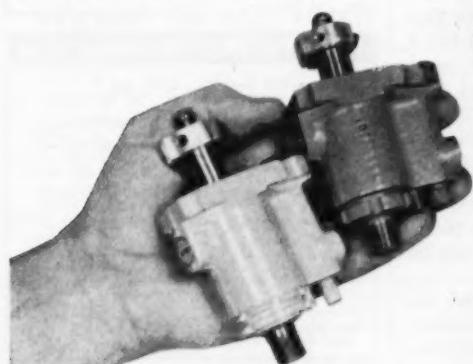
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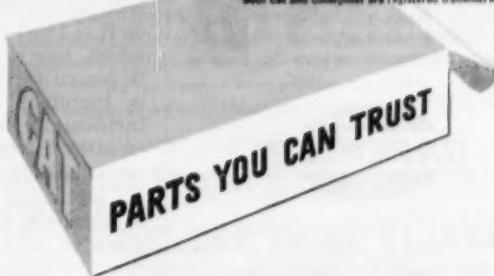
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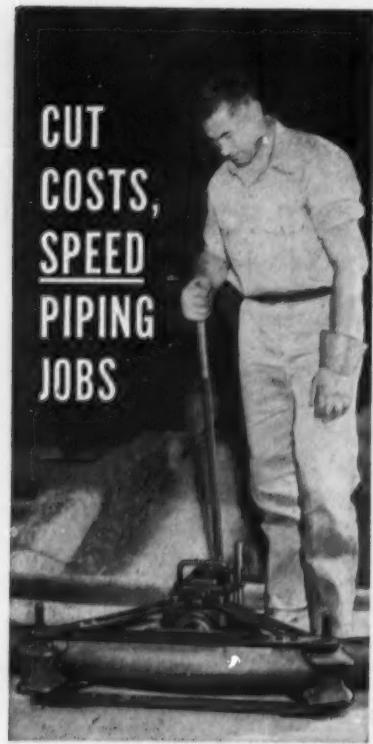
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CONCRETE . . . Continued from page 122

• Proportioning of aggregates is an important part of the A.C.I. method. A somewhat better understanding will be gained if we visualize the process by which the dry rodded weight of the coarse aggregate was obtained. With extreme care and considerable work, we have succeeded in packing 105 lb of the limestone aggregate into a cu ft container. The solid volume of that 105 lb. is .6 of 1 cu ft.

If we were to use the same care and labor in placing each ft of our concrete, 60% of the concrete could be coarse aggregate. For each yd this would amount to 16.2 cu ft (27 times .6) or 2,835 lb. Obviously, that is impractical and it would be mighty expensive; any failure on the part of the workmen would produce the very worst honeycomb we can imagine.

Conditions that exist in our placing operation are such that less than a theoretically perfect amount of aggregate must be used. How much less will depend primarily on the lubricating value (fineness modulus) of our fine aggregate or sand. Table 5 (A.C.I. Table 6) provides a guide in calculating the amount of coarse aggregate which our sand will permit us to use. The factors given in the table are identified as "volume of dry rodded coarse aggregate per unit volume of concrete."

Our concrete technician knows that with a sand F.M. of 2.92, and 1½-in. aggregate, his factor is .71 (interpolated between FM of 2.80 and FM of 3.00). He multiplies the volume of his dry rodded cu ft of aggregate (.6) by this factor and finds that he can use .426 cu ft of aggregate in each cu ft of concrete, or 27 times that amount, 11.50 cu ft solid volume, in each cu yd of concrete.

It will be helpful for most of us, however, to think of the factor in the table as representing the percentage of our theoretically perfect quantity of aggregate (16.2 cu ft or 2,835 lb) which our sand will permit us to use. 71% of 16.2 cu ft is 11.50 ft of coarse aggregate which has a solid weight of 175 lb per cu ft. Our aggregate weight is, therefore, 2,013 lb per cu yd. Incidentally, we get the same answer by taking 71% of our theoretically perfect weight of 2,835 lb.

• A volume of sand makes the remainder of the cu yd of concrete. We now have included in our de-

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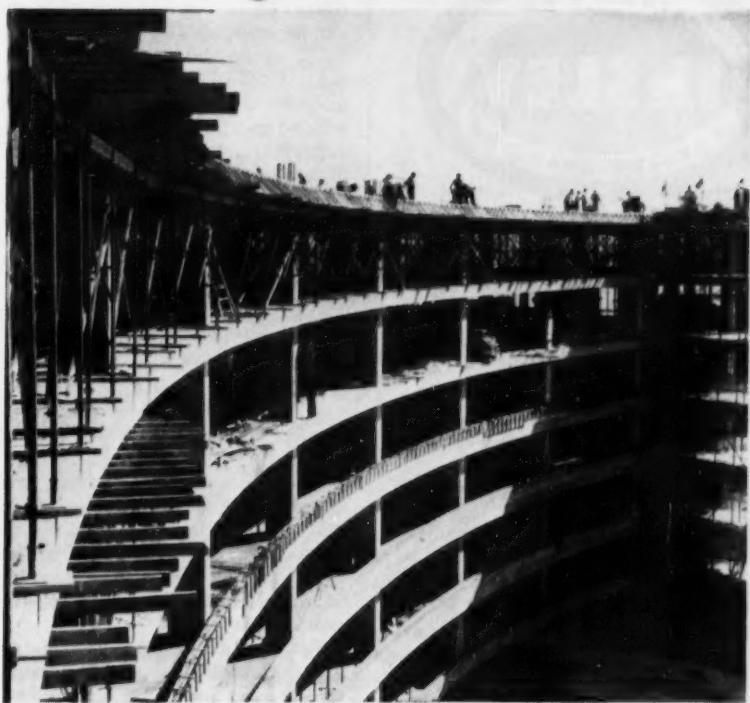
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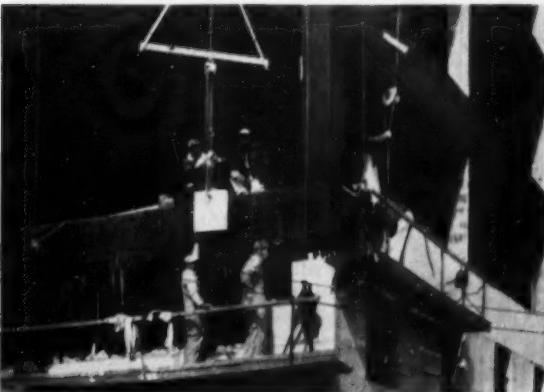
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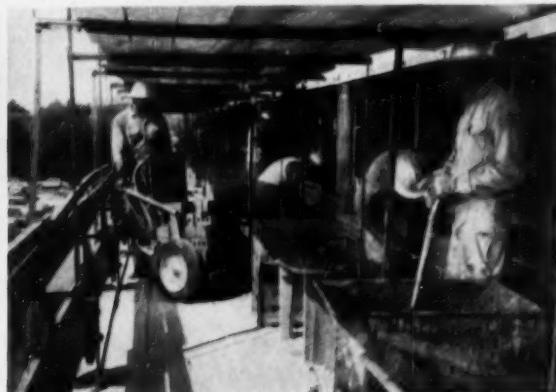
CURVES ON MIAMI BEACH—Three different types of PS Scaffolding can be seen doing three different jobs on the 14-story, \$14,000,000 Fontainebleau Hotel that curves 440' along the ocean front at Miami Beach. While 5-ft. wide "Trouble Seaver"® Shoring frames are supporting formwork for 10th floor, single post Burton's Shores are being used for reshoring on the lower floors. At right, "TubeLox"® Scaffolding makes runways for wheeling concrete, from hoist tower. Taylor Construction Co., general contractor.



WORLD'S TALLEST—Materials for three 707-ft. (from foundations) chimneys being built for the Indiana-Kentucky Electric Corp. near Madison, Ind. are hoisted by "Gold Medal"® Steel Hoist Towers 721 ft. 6 in. high. Custodis Const. Co., chimney contractor.



TEAMED UP FOR SPEED—"Gold Medal" Junior Safety Swinging Scaffolds and a block and tackle stone-lowering arrangement keep stonessetting job moving at a rapid pace on the Prudential Life Insurance Bldg., Minneapolis. 15 of these light duty Scaffolding Machines, with 20-ft. platforms, keep men at correct working height as work advances. Block and tackle, hung from trolley beams on roof, rolls and lowers stone to men. Stonessetting contractor, Axel Ohman. General contractor, C. F. Haglin & Co.



TREND TO MECHANIZATION—A clear area for maneuvering buggy loaded with half-pallet (120 bricks) to masons' stations is provided by 8-ft. wide "Gold Medal" Safety Scaffolding Machines. Scaffolding Machines are set away from wall to give masons an unobstructed 20-in. platform. This specially-designed PS Scaffolding, required by palletizing and mechanized handling of masons' materials, is furthering the trend to more efficient operations. Job is Cedar Apts. Extension, Cleveland. Mason contractor, W. M. West & Son.

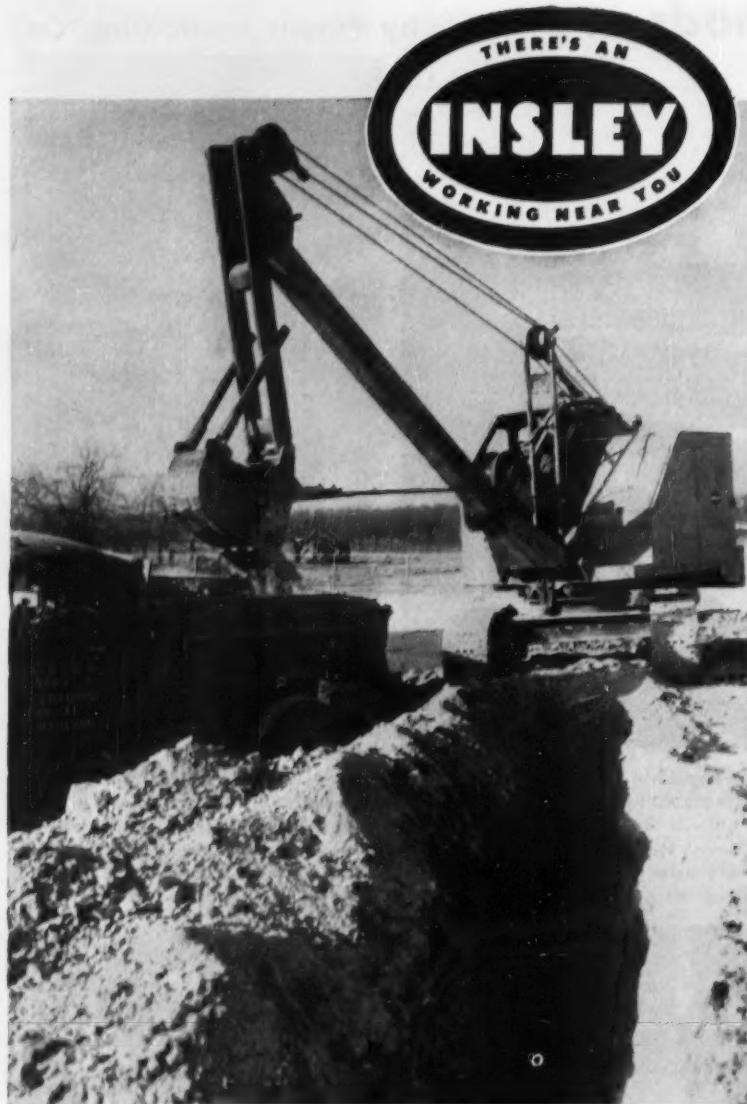
To help you solve any scaffolding problem, PS offers a complete nation-wide engineering service—available locally. See the Yellow Pages in your 'phone book for the nearest Patent Scaffolding office or representative handling "Gold Medal" Scaffolds.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY



THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street, Dept. CM&E, Long Island City 1, N. Y.
6931 Stanford Ave., Los Angeles 1, Calif.
Branches in all principal cities



PROVEN PERFORMANCE

Accepted as a standard of comparison for the industry—the Insley Hoe is rugged, fast, easy to operate.

Simplified maintenance and dependability keep this machine on-the-job... performing profitably.

The Insley Line includes excavators and cranes, 5 to 30 ton capacity—crawler or rubber mounted.

INSLEY MANUFACTURING CORPORATION • INDIANAPOLIS
wholly owned subsidiary
THE MAXI CORPORATION • LOS ANGELES

CONCRETE ... Continued

sign 7.94 cu ft of cement paste and entrapped air, plus the 11.50 cu ft of crushed limestone, making a total of 19.44 cu ft. The remainder of our cu yd, 7.56 cu ft, will be composed of the remaining material, sand. The solid weight of our sand is 165 lb per cu ft, and the quantity needed will be 7.56 cu ft x 165 lb or 1,247 lb. Our design for the concrete to be used for the 4,000-lb concrete required in the manufacturing floor area is:

564 lb (6 sacks) Cement
1,247 lb Sand (SSD)
2,013 lb Crushed Limestone (SSD)
300 lb (36 gal) Water (Total)

To maintain consistency and quality, the weight of the aggregates must be increased by the amount of the water carried on their surface, and the quantity of water must be reduced by the same amount.

For example, suppose a moisture test indicates 5% surface moisture on the sand and 1½% on the limestone. The sand weight will be increased by 5% of 1,247 lb or 62 lb and the limestone by 1½% of 2,013 lb or 30 lb. This total increase of 92 lb in the coarse aggregate must be deducted from the water, and the weights given the batchman would be:

564 lb Cement
1,309 lb Sand
2,043 lb Stone
208 lb Water

It is usually desirable to give the batch weights on sand and aggregate to the nearest 5 or 10 lb. Concrete making is not such a precise science that 1 or 2 lb in a cu yd, weighing more than 2 tons, will make much difference.

* * *

The 14th article in this series in February will discuss an easy system of making mixes of other strengths and qualities and day-to-day control when aggregate gradings vary.

Like Safety Slogans?

"Safety News" is a little bulletin sent out by the Associated General Contractors of Minnesota. Each one is headed by an intriguing slogan. Here are some recent examples: "When you gamble with safety you bet your life"; "Safety has no quitting time"; "Which: A minute for safety? A month for repairs?"; "The chance-taker is the accident-maker." Each one could make a swell poster.



THE NEW UNIVERSAL 293Q TWIN DUAL PACEMAKER

combines peak production with maximum portability

TOP CAPACITY PRODUCTION

The TwinDual Pacemaker gives you three full stages of reduction for top capacity—a Universal overhead eccentric jaw crusher in the first stage and a TwinDual roll crusher for the second and third stages.

No other single unit plant offers so many big-profit advantages. Big primary jaw crusher accepts large rock—lets you work gravel pits containing big boulders. Exclusive TwinDual two-stage roll crusher gives top capacity secondary crushing. Its high ratio of reduction permits the primary jaw to operate at 50 to 100% wider discharge opening. This results in greater capacity—less jaw wear. Larger inclined gyrating screens with full screening area allow 20 to 25% greater output. All operations from apron feeder to delivery conveyor are driven through one single power unit.

For top capacity with three stages of reduction—and a bonus in longer crusher life, lower horsepower requirements and a better quality finished product, choose a Pacemaker. Available in five models for pit or quarry operation. Get complete profit making facts now.

LOW TRAVELING WEIGHT

The primary jaw crusher, apron feeder with grizzly by-pass, operator's platform and structural supports are all mounted as a single unit on skids. This primary unit is bolted to the main truck frame. When highway weight limitations must be met, this unit may be quickly skidded to a low bed trailer and transported separately.



PETTIBONE

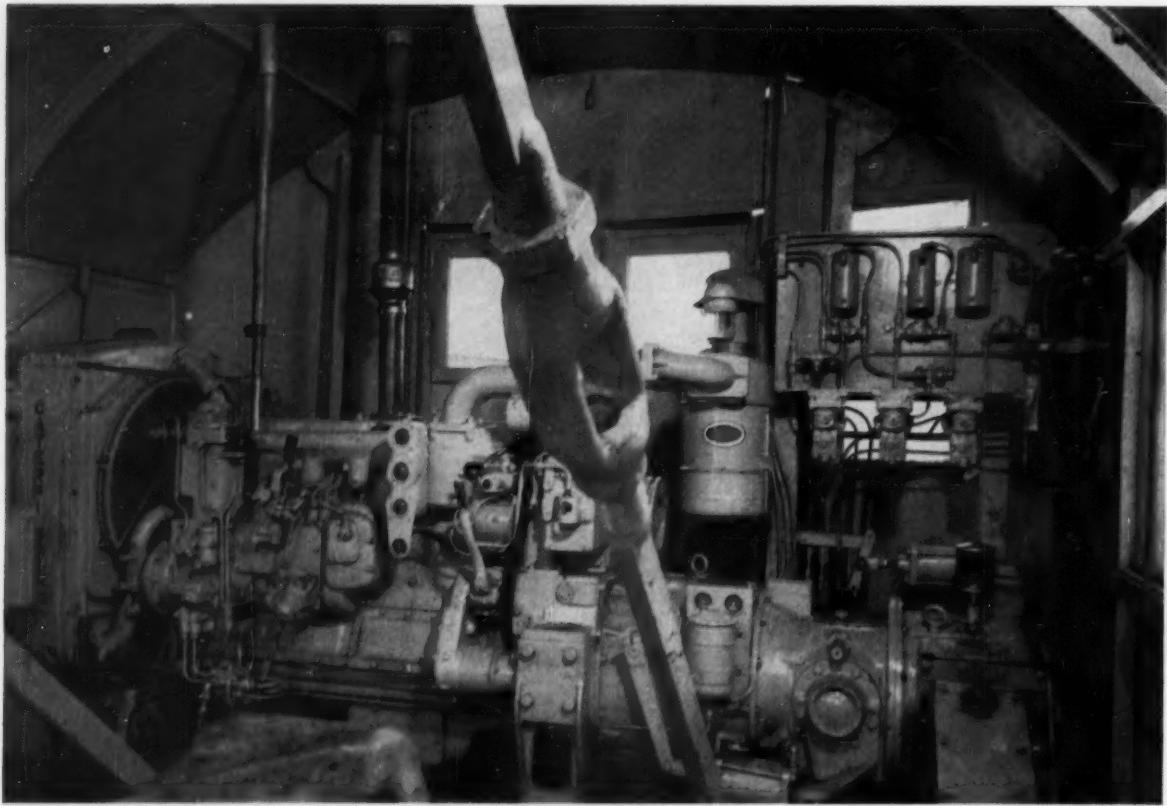
UNIVERSAL

In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION

327 8th Street, N. W., Cedar Rapids, Iowa

Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois



This Caterpillar D318 Diesel—powering a crane—works through a Twin Disc Model CF Torque Converter which provides faster work cycles, protects both engine and driven equipment. Behind the Model CF are a Twin Disc Reverse Gear and two Twin Disc Heavy-Duty Friction Clutches.

Why the trend is to Torque Converters

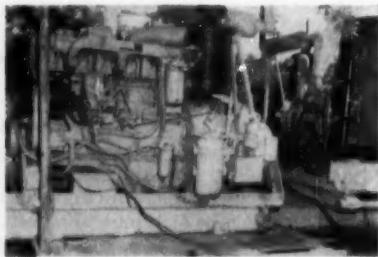
Planning to order a new power unit?

Today, many equipment owners are planning on getting *more* work output . . . and *longer* equipment life: they're ordering their new power units *complete* with Twin Disc Torque Converter Drive. And they're having Torque Converter Drive installed on equipment already working in the field.

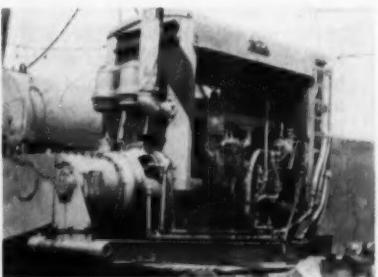
Why? Briefly, here are six *proven* reasons why: 1 Through the Twin Disc Three-Stage design, their engines' output torque is *multiplied up to six times* . . . the highest torque multiplication available. Consequently, they're *eliminating* harmful, costly engine lugging and stalling. 2 With Torque Converter Drive, their engines are working up in the maximum efficiency range *all* the time, delivering *constant* high-horsepower output. 3 Power is *automatically* matched to the load demand, with

gear-shifting minimized or eliminated. 4 Heavy load pick-up is *smooth, even, without* clutch-slippage. 5 Overloads, shock loads, vibrations and torsional variations are cushioned *out*, through fluid connection . . . which means *longer* life, *less* maintenance on engines, transmissions, clutches, drive line components and driven equipment. 6 Torque Converter Drive provides an *infinite* variety of ratios to work with, permitting *smooth, accurate control* of the load and delicate "inchng" or "holding" under power.

So if you're thinking about a new power unit . . . or thinking about present equipment needing more power, more performance . . . *be sure to get the facts on Torque Converter Drive*. Ask your engine dealer. Or write today to Twin Disc Clutch Company, Hydraulic Division, Rockford, Ill., for Bulletin 135-D.



Higher work output is provided by Twin Disc Model CF Torque Converter on Cummins NHRIS-600 Diesel (l.), and by Model F Torque Converter on Cummins HRIS-600 Diesel (r.).



Twin Disc Model F Torque Converter on Waukesha WAK Diesel, driving oilfield hoist, picks up heavy loads smoothly, easily, through up-to-6:1 torque multiplication, infinite variety of ratios.

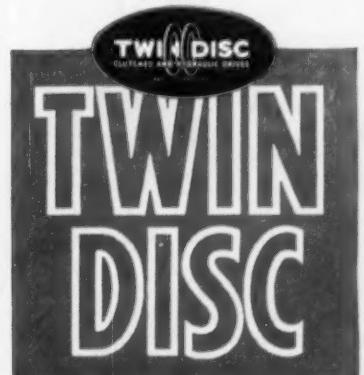
How your engine dealer can equip any power unit up to 650 horse- power with Torque Converter Drive

Any type engine up to 650 hp—gas or diesel—can be easily equipped with a Twin Disc Torque Converter, for nearly any hook-up on any type installation.

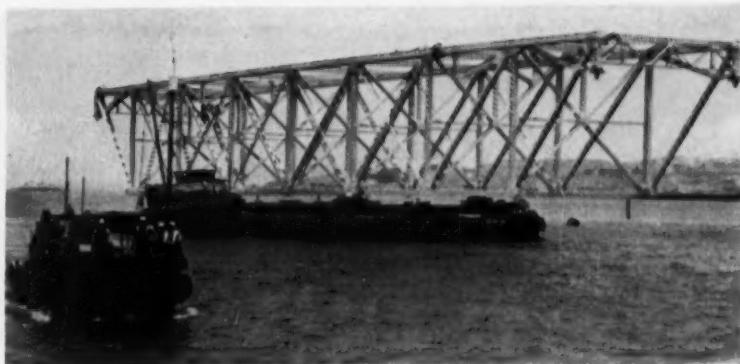
Three Series, or sizes of Twin Disc Industrial-Type Torque Converters are available, with 7 capacities in each size through internal blading variations. And 20 different input, output combinations make Twin Disc Torque Converters easily adaptable to any type application.

The Model F Torque Converter has a gear tooth drive input, and bolts directly to the engine flywheel housing, with no clutch. The Model CF also bolts to the flywheel housing, but provides a clutch between flywheel and converter pump wheel. The Model IF is independently-mounted, with either narrow or wide chain housings on the input end. Each model offers 5 different output combinations: narrow-chain housing, wide-chain housing, straight shaft for direct connection to the driven load, flanged shaft for "U" joint connection to propeller shaft, and a heavy-duty direct-connected rear end.

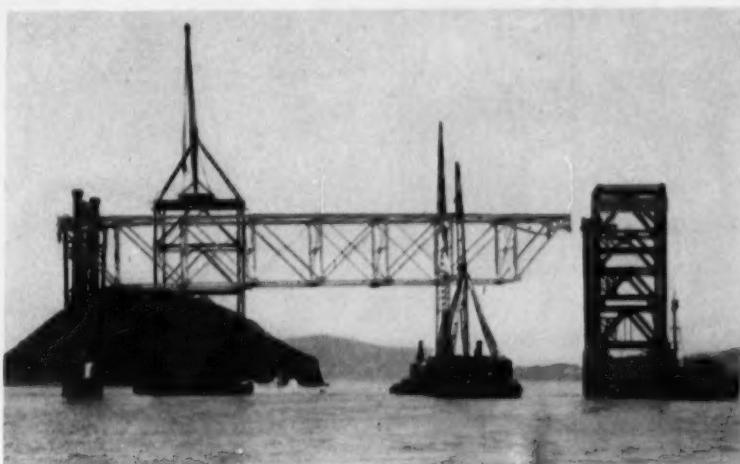
Let your engine dealer show you how easy it is to have your power unit made complete . . . with Twin Disc Torque Converter Drive.



TWIN DISC CLUTCH COMPANY, Racine, Wisconsin
Hydraulic Division, Rockford, Illinois



ALUMINUM FALSEWORK TRUSS on which steel deck spans will be erected is towed on a barge to the bridge site. Lightweight Alcoa aluminum makes the truss easy to handle.



FLOATING RIGS hoist the aluminum truss on to temporary supports. On all other spans, a traveler mounted on the adjacent erected truss hoists one end of falsework.

High Bridge Spans Erected On Aluminum Falsework Truss

HIGH WINDS AND DEEP WATER ruled out conventional methods of erecting 28 steel deck truss spans on California's Richmond-San Rafael Bridge. (See CM&E Dec. '53, p. 50 and March '54 p. 62)

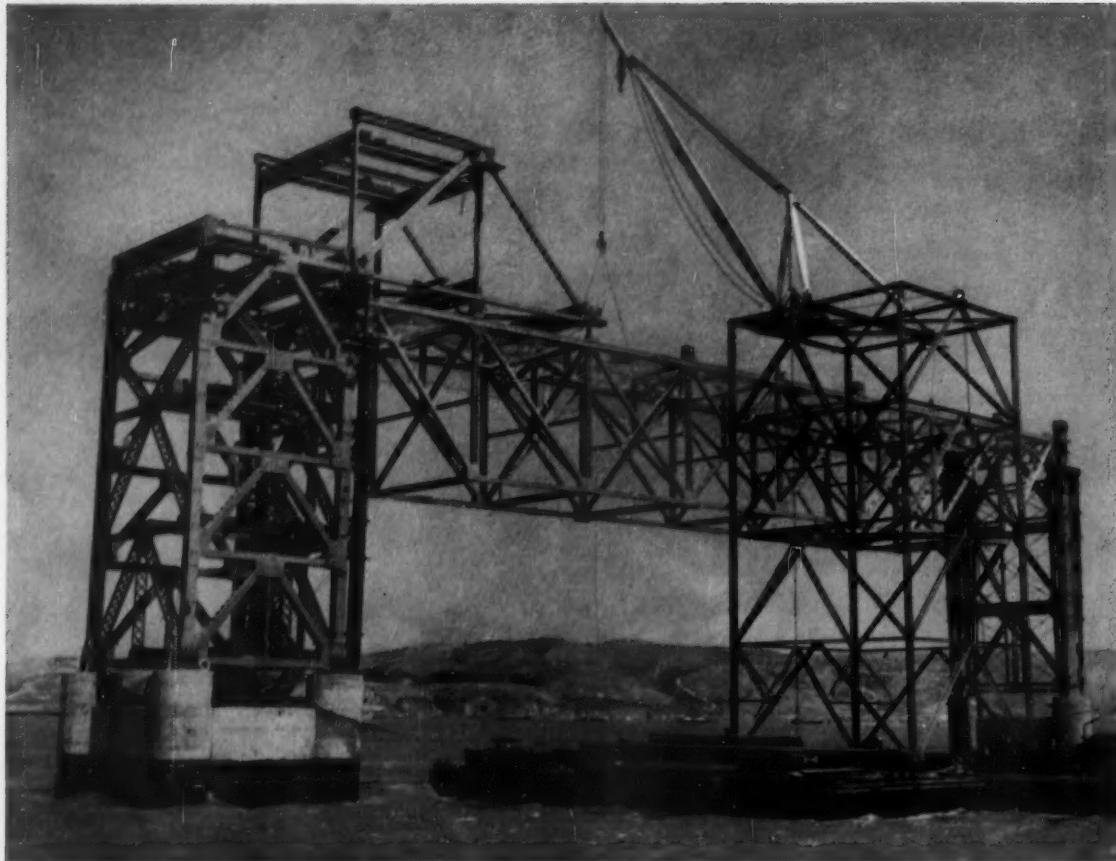
Floating-in methods (see CM&E Nov. '54 p. 50) were not practical because of the treacherous tides and winds. ERECTING IN PLACE was also not satisfactory because the water was too deep to drive piles for temporary falsework bents. A third method, modifying some of the deck trusses and using them first as falsework, was not economically feasible because of the difficulty in hoisting such heavy trusses.

The best answer proved to be

an aluminum falsework truss—light enough to be hoisted in place by equipment already required on the job for other phases of erection. Judson-Pacific Murphy Corp. and Peter Kiewit Sons Co., joint venture contractors, had two 117-ton aluminum spans fabricated and erected at a cost of \$150,000 each. They are 280 ft long, and have panels spaced 36 ft apart, identical with the panel spacing on the deck trusses.

The first step in the erection procedure is to set up temporary timber bents on the concrete piers for supporting the aluminum truss. The next step is to lift the span on to the bents. On the first span this was done with floating equip-

SAN RAFAEL BRIDGE . . . Continued

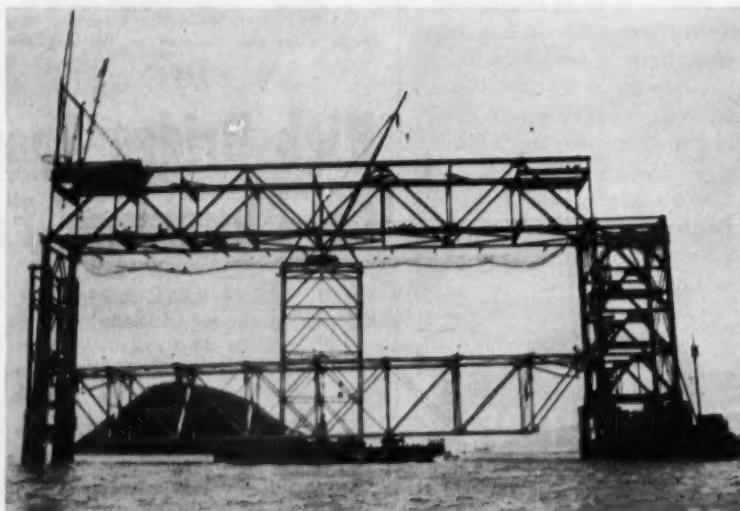


STEEL DECK SPAN for Richmond-San Rafael Bridge is erected on aluminum falsework truss. When completed, span is lowered on to supports by jacks set up underneath at panel points.

ment. All subsequent spans, however, are hoisted by a floating rig and a traveler mounted on the floor beams of the previously erected span.

The floating rig consists of a 75-ton stiff-leg derrick mounted on a 130-ft tower. Power is supplied by a Washington steam winch. The traveler on top of the erected span has double booms powered by a 35-ton American winch.

When the aluminum span is set in place, steel is erected on top with the traveler. Next follows the intricate job of bending the steel piers to make the pin connection with the steel span. Toggles in the aluminum truss can move a pier up to 5 in. Vertical movement of the steel span is provided by three sets of 150-ton jacks placed on top of the aluminum span at three of the seven panel points. As the jacks are relieved, the support of the truss is transferred from the aluminum span to the steel piers.



DOUBLE-BOOM TRAVELER mounted on completed span controls lowering of aluminum truss on to waiting barge. Safety net made of 3/8-in. rope is hung under span to protect riveters.

The aluminum span then is lowered on to a barge, moved between the next two piers, and raised into position.

Philip Murphy is project sponsor, Francis Murphy is project

manager, and Bill Ziegler is erection superintendent for the contractor. The work is under the direction of the Division of Bay Toll Crossings of the California Dept of Public Works.



SPECIFY *Yellow Strand...*

Above: An artist's conception of Folsom Dam. (1) The concrete main structure. (2) Million-acre feet reservoir. (3) Power house and tail race. (4-5) Folsom prison. (6) Auxiliary rock fill. (7) Earth fill.



As equipment removes 40-60 feet of sand and gravel to get to bed rock, the main trestle is readied for the push across the canyon.



Five months later, the dam rises on canyon floor. Gantry and trestle speed handling of concrete. Abnormal floods caused a delay in the work.

WITH 25,000 cu. yds. of concrete going into the main structure each week, Folsom Dam is speeding toward completion. In spite of floods and other natural delays, contractors Merritt-Chapman & Scott and Savin Corporation have kept work on schedule.

The huge dam, built to provide flood control, irrigation and power on the American River near Sacramento, is a \$29.4 million project of the Corps of Engineers. The structure will contain 1,200,000 cu. yds. of concrete and will stretch out for a quarter of a mile with flanks protected by another 1½ miles of rock and earth fill. More than 9,000,000 cu. yds. of earth and rock will have been excavated and 800,000 cu. yds. of selected fill will have been put into place when the dam is completed.

Work started in 1951 and contract completion date is in 1956. To date, well over half the project is finished and present work is moving at a fast clip under direction of D. E. "Dave" Stinson, Project Manager, and L. G. Sumner, Project Engineer.

And to keep machines working under this stepped-up program of production, Yellow Strand Wire Rope is specified by the contractors.

Yellow Strand Wire Rope is made of steel drawn to precise specifications to give it strength for a longer, trouble-free work life. It's flexible to take the blows of impact and the wear of fast-running sheaves. Contractors know from experience that Yellow Strand on their machines is one way of assuring against downtime due to wire rope fatigue. They know that ropes they need will be in stock at nearby Broderick & Bascom distributors.

**TRY YELLOW STRAND WIRE ROPE . . .
YOU'LL SPECIFY IT FOR ALL YOUR CONTRACTS!**

BRODERICK & BASCOM ROPE CO.

4203 UNION BLVD.
ST. LOUIS 15, MO.

655 EDMUNDS ST.
SEATTLE 8, WASH.

If

No. 6.25		YDS.	6	MIX	SAND	100	10	1	CONT.
TYPE		10,000							
CEMENT	4 2		8 4 1	8 4 2 1	8 4 2 1	8 4 2 1	8 4 2 1	8 4 2 1	2 1
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WATER			8 4 2 1	8 4 2 1	8 4 2 1	8 4 2 1	8 4 2 1	8 4 2 1	0

CARD-CONTROLLED BATCHING is here ... and BUTLER has it!

A punched card now can be your batching operator. The human element — the chance of error — is gone. No dials to set, no levers to pull. The punched card does it all in the new BUTLER XK1 Electronic Batcher.

Selection, proportioning, filling, weighing and discharge of 6 aggregates, 3 types of cement — plus water — are automatic and completely interlocked. Every discharged batch is correct — to a split pound . . . Another feature never before offered: The electronic controls also compensate for moisture in

sand or aggregates — and further, compensate for that compensation.*

*NOTE: To the mathematically minded: For example, 5% moisture in the whole is also adjusted for the correlative percentage in the adjustment. In other words, it integrates successive increments.

Batching at 186,000 miles per second.

The BUTLER XK1 Batcher combines the accuracy and sensitivity of weight control, the flexibility of punched card systems and the speed of electronics, which is the speed of light.

Virtually infinite batching selections.

From the holes punched in the card, the electronic control unit predetermines ingredient type, desired weight for each ingredient and the sequencing. An astronomical number of combinations of batch proportion is instantly available to the operator. A batch may be repeated at once or next year with equal ease. With the proper auxiliary equipment, bookkeeping, pricing and invoicing could also be handled from the same punched card.

Permanent, legal record.

Those cards constitute a permanent file instantly accessible for repeat orders. Further, the cards are tamper-proof, legal records of the exact weights and proportions of materials in every batch. Successive batching of the same combination is simply a matter of touching the starting button after each cycle.

Quick, easy maintenance.

Maintenance of the electronic equipment is so simple that any local radio repairman is perfectly capable. Moreover, unitized circuits permit any element to be replaced as quickly as a light bulb, so that it can be serviced at leisure.



You Produce Concrete . . .

TAKE a LONG, CLOSE LOOK at this CARD



One man for a two-man job.

The control cabinet can be located in the dispatcher's office — at a distance from the plant — and the dispatcher can operate the batchers directly.

New Horizons.

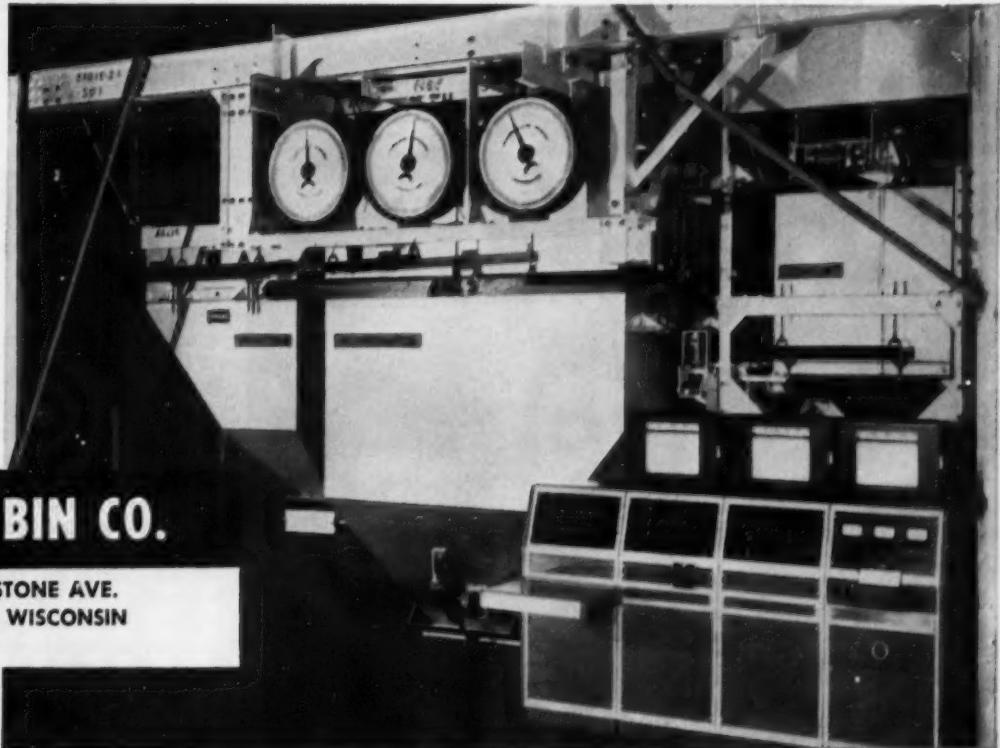
This great BUTLER development is of revolutionary importance to those in the concrete industry who are concerned with the complete integrity of their product and who wish to provide new horizons of economy, accuracy, flexibility, sensitivity and speed for the benefit of themselves and those whom they supply.

As An Historical Note.

The first BUTLER XK1 Electronic Batcher was developed by the Butler Bin Company with its vast experience in batching problems together with Fairbanks-Morse and Company, Electronics Division, which has pioneered and established leadership in the electronics field. It has been installed at the Cleveland Builders Supply Company in Cleveland, O.

You, too, can benefit.

Existing concrete plants can readily be converted to BUTLER XK1 equipment, no matter what make of your plant. Your Butler Engineer will be glad to supply all data — but please, make your inquiry on your letterhead.



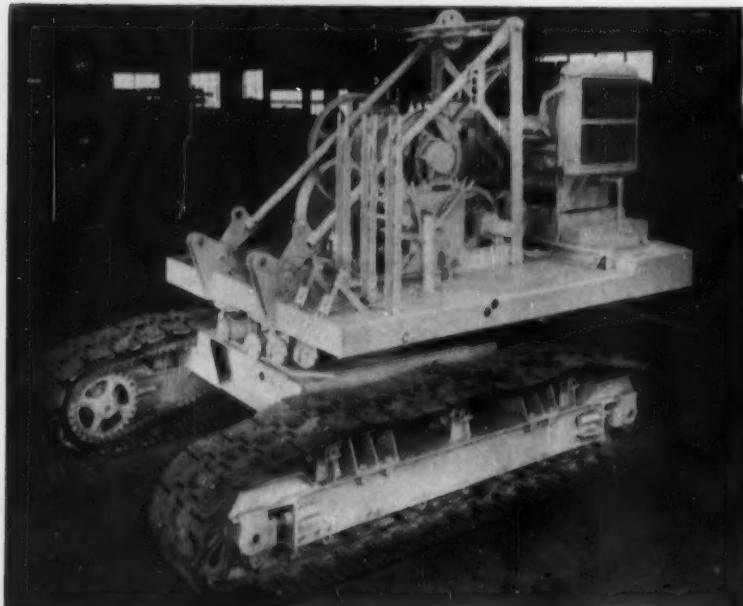
BUTLER BIN CO.

949 BLACKSTONE AVE.
WAUKESHA, WISCONSIN



A "Custom-Made Excavator at Production-Line Costs" is how the manufacturer describes this ...

Newest of $\frac{3}{4}$ -Cu Yd Crane-Excavators



THIS IS THE DECK MACHINERY on the crawler mounting of the Wayne Model 70. All machinery is secured to main center section. Box-type construction is light, but strong.

THE WAYNE MODEL 70, a completely new $\frac{3}{4}$ -cu yd, 14-ton crane-excavator of the crawler type, is being announced late this month by the pioneers of rubber-tired self-propelled cranes, Wayne Shovel and Crane Div., of the American Steel Dredge Co., Inc., Ft. Wayne, Ind.

One of the advantages of the Model 70 is that the buyer can specify exactly the unit he needs to meet his individual requirements. Extra optionals can be added later, if needed, with no expensive change-overs in parts, and the job can be done in the field. The basic model has been designed to make all major wearing parts interchangeable throughout the entire machine. For example, the clutch parts of the hoist-drum assembly are interchangeable—right- to left-hand position. Only one set of replacement parts need be stocked. This economy feature also applies to the reversing shaft clutch assembly. Anti-friction

(Continued on page 136)

ON THIS DIFFICULT NEW YORK
ELEVATED HIGHWAY JOB...

Concrete is discharged from elevator into twin hopper where Whiteman Power Buggies load up.

Power Buggies speed along runways at fast clip, handling average 10 yd. per hour on 300 ft. haul.

Highway deck slab is spread and finished to a perfect level with Whiteman Screeding Machines.

Whiteman POWER BUGGIES
& 2 SCREEDING MACHINES HANDLED

**215 YARDS
OF CONCRETE PER DAY!**

A tough assignment . . . delivering and pouring concrete for a highway 23 to 31 feet above heavy traffic. Yet it was done smoothly, efficiently on Manhattan's East River waterfront through the use of Whiteman Power Buggies. Operating over portable wood runways, four Power Buggies handled from 180 to 250 cu. yds. of concrete in a 5 to 6 hour period, averaging better than 40 yds. per hour on an average 300 foot haul.

Spreading and finishing concrete for the highway deck was done in record time by two Whiteman Screeding Machines* covering a 37½ ft. wide slab pour . . . saving time, compacting the slab, bringing moisture to the surface and screeding to a perfect level.

Whatever your problems in placing and finishing concrete, call your Whiteman distributor for helpful information.

*Approved by New York State Highway Engineers

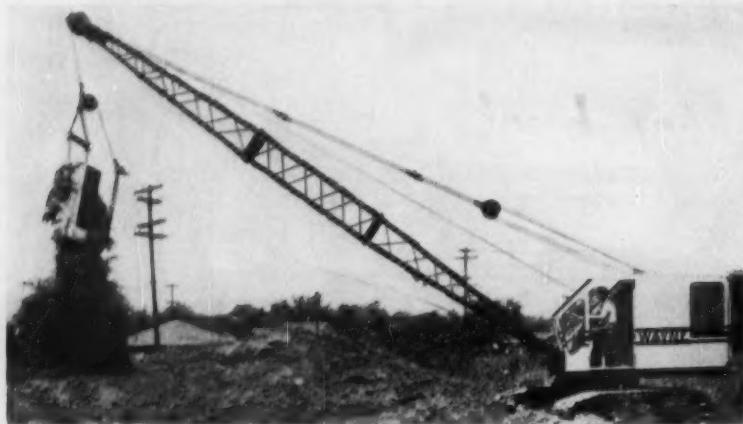
General Contractor: Feltner Pile Co. Subcontractor for concrete deck: Ekdil Contracting Corp.

WHITEMAN MFG. CO., DEPT. C
3249 Casitas Ave., Los Angeles 39, Calif.
Please send prices, literature and name of
distributor for Screeding Machines,
 Power Buggy Floating Finishing
Machines.

Name _____
Firm _____
Address _____
City _____ Zone _____ State _____

Whiteman

THE LEADER IN CONCRETE EQUIPMENT



CONVERSION FROM SHOVEL to dragline or with other attachments can be made in the field with interchangeable parts and assemblies. Boom length of the dragline is 35 ft. Weight, less extra counterweight, on standard length crawlers on 24-in. treads is 34,400 lb.



NEWLY DESIGNED FAIRLEAD is of 4-sheave, swivel type. It has replaceable wear bars with rugged construction for long wear.

bearings are used on both assemblies. This feature should mean lower initial investment costs, as unwanted or unneeded accessories are eliminated.

The manufacturer calls it a "custom-made excavator at production-line costs." Price is expected to be in the \$15,600-\$18,800 class, depending on attachments.

The pilot model was completed in February of last year, and since that time has been undergoing shake-down tests in the field with various attachments in the hands of contractors.

Field tests proved the machine to have excellent stability, good maneuverability and steering.

Engines available are gasoline Waukesha 6MZA and Continental B427 and diesel General Motors 3055. All are in the 80-90 hp class.

A positive crawler lock in the

crawler mounting gives complete travel control at all times.

The Model 70 also has a vertical propel shaft assembly which helps eliminate bending of the shaft and permits longer wear and easier maintenance. The gear is driven by vertical swing shaft deck gear. The unique design of the lower pinion hub within the lower bearing and the extra bearing at the deck level have eliminated shaft deflection due to gear load. This same design is also used for the vertical swing assembly. Involute splines are used for maximum strength and wear.

Ground clearance is 14 in., and tracks are available in standard lengths of 11 ft 4 in., or optional 12 ft 7 in. Noteworthy in the trench hoe specifications are the 19-ft boom length which permits a 31-ft 2-in. reach and digging depth of 20 ft 5 in. The working weight of the machine is only 37,600 lb.

One-Lever Controls

For crawler traveling and steering, one hand-lever controls all locking combinations and one hand-lever controls all steering.

The boom hoist assembly permits the operator to lower with power or against a large brake surface which incorporates a safety ratchet. This assembly is out in the open for easy maintenance.

The revolving superstructure base is of box-type construction and is light and strong. All main forces are balanced out. The center journal sleeve is replaceable. All machinery is secured to main center section and not to side plates.

Counterweights totaling 4,000 lb



NEW WAYNE gives ample ground clearance of 14 in. Field tests prove good stability, maneuverability with adequate power.

are built into the rear end, with the center of gravity in the rear and placed low to give more free lifting power.

Optional features available are independent-type boom, hoist, brake-type cab lock, extra long crawler and double load rotating rollers.

The model 70 is presently available as a shovel, trench hoe, crane and clamshell and dragline.

SPECIFICATIONS Wayne Model 70

General Data

Width of cab	8 ft 0 in.
Over-all clearance height from grade	10 ft 0 in.
Radius to rear end of cab	8 ft 7 in.
Distance of boom foot pin from center of rotation	3 ft 0 in.
Height of boom foot pin above grade	4 ft 8 1/2 in.
Rear end of cab clearance from grade	3 ft 5 in.
Width of standard tread shoe (20 & 30 in. optional)	24 in.
Over-all length of standard crawler	11 ft 4 in.
Over-all length of long crawler	12 ft 7 in.
Over-all width of crawlers with 24-in. treads	9 ft 6 in.
Over-all height of tread belt	2 ft 6 1/2 in.
Minimum ground clearance	14 in.
Swing speed	5 rpm
Travel speed	.93 mph

CAN YOU DESIGN CONCRETE?

- Concrete specifications usually call for a definite strength requirement. Skilled technicians often can meet "spec" and lower costs at the same time. Read "Design and Control of Concrete Mixes," beginning on page 102.

Dempster-Diggster bucket GETS A FULL LOAD WITH EVERY STROKE!

The hydraulic crowd and hoist operation of the new Dempster-Diggster GRD-101 gives you big shovel advantages in front end loading and excavation work. As shown in the at-work photos at right, here's what happens: Dempster-Diggster moves into material with shovel lowered against front of frame. No wheel traction is used to get excavation power. The hydraulic crowd and hoist moves bucket out and up following contour of material—getting a full bucket with every stroke . . . reducing loading time and idle truck time, thus getting the job done faster!

When you put your Dempster-Diggster into operation, one of the first things you will find is that your entire operation must be geared to a faster pace. This means greater efficiency of equipment and manpower—more profit to you!

Write us asking for Folder No. 3116 giving you complete information on the features of the Dempster-Diggster, including TRUCK-SPEED MOBILITY TO AND FROM JOBS . . . AUTOMATIC BUCKET TRIP . . . MAXIMUM DUMPING AND DIGGING HEIGHT . . . MINIMUM TURNING RADIUS . . . THE SHOVEL WITH TORQUE CONVERTER . . . HYDRAULIC STEERING, etc. Manufactured by Dempster Brothers, Inc.

In photo below camera catches Dempster-Diggster ready to back off and move up to a truck for loading.



DEMPSTER BROTHERS 315 SHEA BLDG., KNOXVILLE 17, TENN.

On-the-Job CONTRACTOR-LABOR RELATIONS

By LEON B. KROMER, JR.

Minimum Wages to Go Up?

IF LABOR SECRETARY MITCHELL has his way, you can look for a major battle in and out of Congress. He is trying to sell the White House and the President's Council of Economic Advisors on raising the floor of wages under the Federal Wage-Hour Law and broadening its coverage. (For a discussion of contractors and the Wage Hour Law see CM&E, March '52, p. 100.)

At present, employees covered by this law must be paid not less than \$.75 per hr and at least time and one-half their basic hourly rate for all time worked in excess of 40 hr in a scheduled work week. While the Secretary's proposal to up the minimum is a deep secret, it is expected that he will recommend an increase of either \$.10 or \$.15 per hr. Business groups are already preparing their artillery for an offensive against any increase, and labor organizations are consolidating for strong support of the Secretary's plan.

What would these changes mean to you?

Increasing the minimum rate will tend to push up all other wage rates to maintain historic differentials in rates of laborers and mechanics.

In many areas in the south and southwest unskilled labor on construction is paid less than 85c or 90c per hr. When employed on work considered covered by the Wage-Hour Law, these men would have to be paid higher wages.

Many contractors employ watchmen at the present minimum of 75c per hr. These men are often on a job for 60 hr or more a week. In many cases watchmen employed on construction sites are considered covered by the law. Their hourly rate would have to go up to the new minimum. Depending upon the number of hours they must remain at the site, it is possible for their take home pay to approach that of skilled mechanics.

Even without strong opposition from business organizations all will not be smooth sailing for the Secretary's plan. With both the

House and Senate Labor Committees headed in the new Congress by Southern Democrats, it is certain that Mitchell will have a rough time. Representative Barren (N.C.) will chairman the House Labor Committee and could block a bill (unless outvoted from his own side) to up minimum wages and broaden coverage of Wage-Hour. The powerful Rules Committee will be headed by Representative Howard W. Smith, a conservative Virginian who can be counted upon to attempt a blockade of any increase in minimum wages.

Two Labor Agreements

Can two independent contractor-groups negotiate labor agreements with the same building trades unions for the same area but different types of construction? This was the question posed to a panel of building and heavy contractors for discussion before the delegates to the 59th annual convention of the Building Industry Employers of New York State. The panel was made up of members of the BIE, an organization composed of contractors and subcontractors engaged primarily in building construction and representatives of the New York State Chapter, Associated General Contractors—the heavy and highway contractors of the state.

Collective agreements with the

building trades unions for wages and working conditions of men employed on building construction have for more than 50 yr been negotiated by local contractors' associations affiliated with the BIE. Heavy and highway agreements are negotiated on a state-wide basis (except for New York City and Buffalo) between international officials of the four major trades (engineers, carpenters, laborers, teamsters) employed on this type of construction and the state AGC chapter. Some conflicts have developed over different wages and overtime provisions of the various agreements.

From the discussion it appeared that both sides were in agreement, that so long as the distinction was made as to what work is heavy and what is building construction, each employer group should negotiate with the unions representing the men they employ.

The panel form of discussion tended to clarify much misinformation and misunderstanding. The outcome, it is expected, will mean closer cooperation between the two groups of contractors.

From Here and There...

Dick Gray, President of the AFL Building Trades Department told the recent bricklayers' convention that efforts are going to be directed in the next Congress to get a new labor law to apply specifically to the construction industry. He has long maintained that Taft-Hartley was never written to fit the special needs and conditions of the construction industry which should have a law applying to it such as the transportation industry with its Railway Labor Act.

Albert C. Beeson, appointed early this year to fill the vacancy on the National Labor Relations Board when Paul L. Styles resigned, has indicated that he is not available for reappointment. His term expired December 16. No announcement has been made as to his successor.

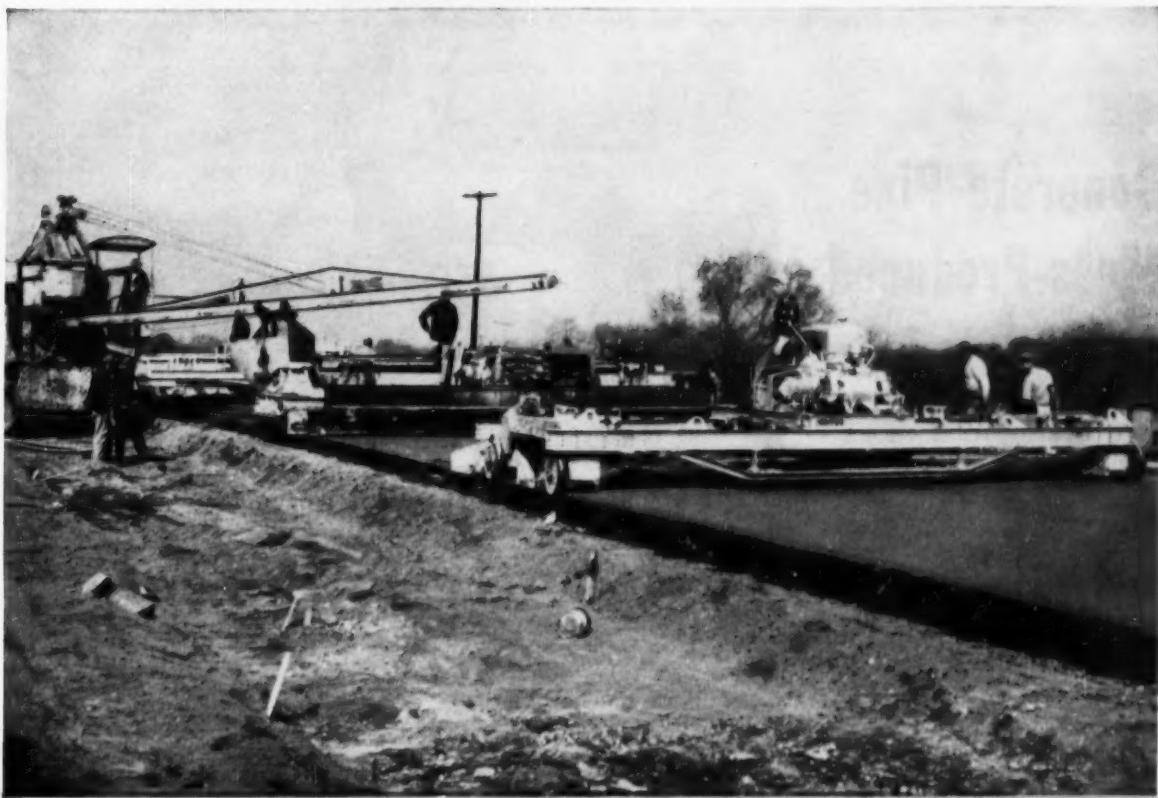
Marcel Mallet-Prevost is the new assistant general counsel of NLRB to be in charge of litigation. It will be his job to enforce Board orders.

Famous Last Words...

(By L. H. Scott, Turner Construction Co.)



"THESE BOARDS ARE SAFE!"



BLAW-KNOX
"COMPLETE
PACKAGE"
cuts
paving costs
on Ohio
Turnpike

The first concrete paving on the Ohio Turnpike was finished in December *well ahead of schedule* to speed traffic from the Pennsylvania Turnpike westward. The speedy completion of this contract and the low paving costs are typical of "Complete Package" operations on the majority of turnpike projects.

The Blaw-Knox "Complete Package" gives you advantages you get nowhere else! One source and one responsibility for *all* your concrete paving equipment; one distributor source for prompt maintenance and parts service; low maintenance and high-speed production from the smooth, balanced operation of equipment designed as one "family."

On the Ohio Turnpike job, a Blaw-Knox P-150 Base Paver placed the base material to specifications and a Precision Subgrader brought the subgrade to exact contour and elevation. The contractor also used Blaw-Knox Self-Aligning Road Forms, two Concrete Spreaders (one with vibratory attachment), two Finishing Machines and a MultiFoote 34E Dual Drum Paver.

The Blaw-Knox "Complete Package" also includes Aggregate and Cement Batching Plants, Airport Paving Forms, Clamshell and Concrete Buckets, Road Wideners, Bituminous Paver-Finishers and Admum Black Top Pavers. See your Blaw-Knox distributor today for the "Package" that's tailor-made with the units you need.

BLAW-KNOX COMPANY
Blaw-Knox Equipment Division

Pittsburgh 38, Pa.
Offices in Principal Cities



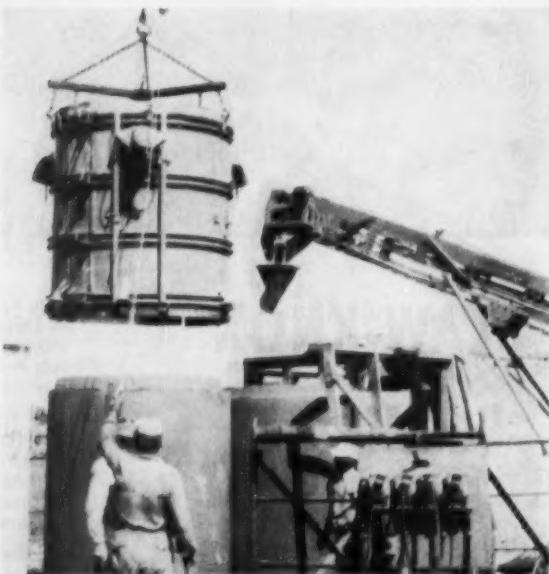
Concrete Pipe Mass-Produced With One Form



PORTABLE PIPE PLANT requires only conveyor, crane, one form and curing equipment. Concrete mixed in plant is conveyed from dump truck and poured into vibrating form.



CORE FORM is pulled out as soon as pipe is poured and vibrated. Powerful vibrating of low-slump concrete is the key to mass-producing high quality pipe of all sizes with a single form.



JACKET FORM is lifted off freshly poured pipe and swung over core form set on adjacent slab. Pipes 54 in. in dia and 6 ft long are turned out every 20 min by simple portable plant.

POWERFUL VIBRATING of low-slump concrete is the key to a process of mass-producing pipe with a single form. Developed by George W. Hoffmann Co. of Sioux City, Iowa, the Vibrapipe process can turn out high quality sewer pipe with a minimum of equipment.

One of the main features of the process is the simplicity of setting up a portable plant. Near Winnipeg, Canada, for instance, Manitoba Supercrete, Ltd. turned out about 10,000 ft of sewer pipe with a portable Vibrapipe plant. Pipe size ranged from 24 to 96 in. in dia. Production of the smallest size

averaged one every 15 min, and the largest size averaged one every 30 min.

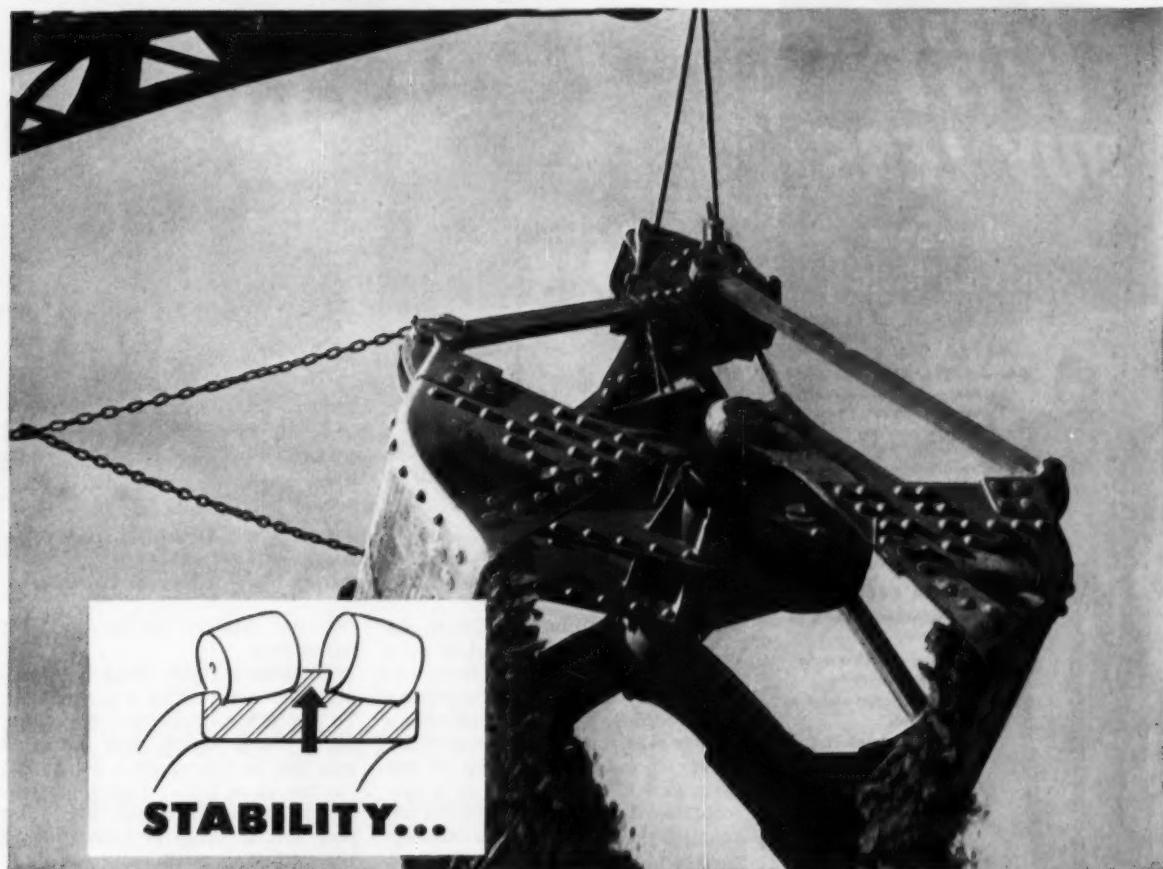
Basically, the process consisted of placing concrete inside a special steel form in a continuous layer by pouring it with a swivel chute. As the concrete was placed, low frequency vibrators mounted on the sides of the form delivered an impact of 500 to 3,000 lb per revolution through conductors welded to the form. When the pouring and vibrating were completed, the form was disassembled and moved ahead.

The plant was set up by pouring

concrete slabs in the ground to support the base pallet rings that form the bell of the pipe. Pallet rings were placed on the slabs, a core form was set up inside the first ring, and a jacket form assembled outside. The jacket form mounted vibrators, loading hopper, and pouring cone.

When the form was ready for pouring, a 45-ft conveyor was moved into position with the swivel chute over the pouring cone. Ready-mix concrete was carried up the conveyor, dropped through the swivel chute, over the pouring cone, and down into the

IN THE CRUSHED STONE INDUSTRY, TORRINGTON BEARINGS are used in many applications, including crushers, screens, shovels, cranes, pulverizers, grinding mills and rotary kilns.



TORRINGTON Spherical Roller Bearings

are designed with integral center flange
on inner race to provide positive radial stability
and positioning for thrust loads

This center flange guides the rollers accurately and friction is reduced to a minimum.

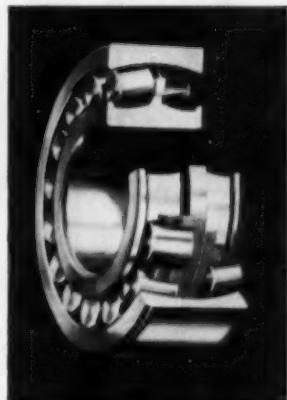
Other performance-building features include accurate geometrical conformity between races and rollers to provide ultimate load carrying capacity; carefully heat-treated races and rollers for maximum resistance to shock and wear; one-piece machined bronze cage for each path of rollers to allow thorough lubrication and give freedom of operation.

These are some of the reasons why TORRINGTON SPHERICAL ROLLER BEARINGS give long, satisfactory performance.

TORRINGTON SPHERICAL ROLLER BEARINGS are available from stock with either straight or tapered bore, for shaft or adapter mounting.

Specify TORRINGTON and get these operational advantages in your equipment.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.



District Offices and Distributors in Principal Cities
of United States and Canada

TORRINGTON SPHERICAL ROLLER BEARINGS

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

MAKING PIPE WITH ONE FORM ... Continued

**WHY
BUY LESS**
...the best
costs so little.



CM HOISTS AND PULLERS

are ruggedly constructed to give you years of trouble-free service. Yet they are unusually light...easy to handle because they are constructed of the strongest alloys of steel and aluminum. Equipped with famous Herc-Alloy flexible, welded alloy steel load chain.

CM CYCLONE

- Capacities from $\frac{1}{2}$ to 10 ton.
- 1-ton model weighs only 35 pounds.
- 96% efficient—easy to operate.
- Lifetime lubricated.



CM PULLER

- Capacities $\frac{1}{2}$, $1\frac{1}{2}$, 3 and 6 ton.
- $\frac{1}{2}$ -ton model weighs only 13 lbs.
- Lifts or pulls at any angle.
- Lifetime lubricated.

Write for catalog
and name of your
nearest CM dealer.



CHISHOLM-MOORE HOIST DIVISION

COLUMBUS MCKINNON CHAIN CORPORATION

TONAWANDA, NEW YORK

DISTRICT OFFICES: NEW YORK, CHICAGO, CLEVELAND

In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ont.

CURING TENTS are erected over freshly poured pipe as a jacket form is assembled for the next pour. Steam is admitted into the curing tents after about 2 hr.

form. Pouring time for a 54-in. dia pipe 6 ft long was about 8 min.

The cone and hopper were removed as soon as the vibrating was completed. A tongue-forming header was then lowered on to the excess concrete at the top of the form and vibrated down in a few seconds. A twisting action helped smooth the surface. The header, core, and jacket forms were then

removed and set up on the next pallet ring.

Meanwhile, the freshly made pipe was covered by a curing tent. To protect it from sun and wind, 2 hr later, steam was admitted into the tent through a 2-in. inlet in the base slab. The pipe was steam-cured for about 2 hr and then left to stand at least 10 days before laying in the trench.

SALES AND ★ SERVICE ★

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

C. S. Johnson Co.: Announces these new distributor appointments: Cook Brothers Equipment Co. in central and northern California from an office at 444 8th St., San Francisco; W. L. Johnson Machinery Co. of Midland, Tex., in the northwestern Texas territory, east of the Pecos River; G. C. Phillips Tractor Co., 4419 First Ave., N., Birmingham 6, Ala., will represent the company in Alabama and the Pan Handle of Florida.

International Harvester Co.: Appointment of Howell Tractor & Equipment Co., 7443 S. Racine Ave.,

Chicago, as northern Illinois and northwestern Indiana distributors for International Industrial power products has been announced. Area covered includes the Illinois counties of Cook, Lake, DuPage, Will, Kankakee, McHenry, Kane, Kendall, DeKalb, Boone, Winnebago, Ogle, Lee, Jo Daviess, Carroll and Whiteside, and the Indiana counties of Lake, Porter and La Porte.

Hose Accessories Co.: Announces the appointment of Durrie Sales Co. of Chicago as its representative in the Illinois, Indiana, and Iowa marketing area for its line of LE-HI hose couplings, valves and accessories. The headquarters of the Durrie organization are located at 805 W. Washington St., Chicago 6, Ill.

Koehring Co.: Recently appointed exclusive distributor, the Dalrymple Equipment Co. of Memphis, Tenn., will handle the complete Koehring line of heavy-duty construction equipment along with products manufactured by the Parsons Co.

(Continued on page 146)



with this light-weight
I-R Pin Driver

The Ingersoll-Rand PB-59 Paving Breaker, equipped with a pin-driving fronthead, speeds up the driving of form pins on road building work at least four-to-one, as compared to any other method. One man with a PB-59 can keep up with the pin setter—driving the pins in from 5 to 10 seconds each. What's more, this air powered tool, weighing only 40 lbs. drives the pins *straighter and tighter* than could possibly be done by hand.

**The PB-59, with Paving Breaker Fronthead,
is the ideal tool for**

- digging hard earth
- backfill tamping
- general demolition work



Your nearest I-R representative will be glad to give you complete information on this labor-saving PB-59, or any other item in the *complete line* of Ingersoll-Rand Paving Breakers and Accessories.

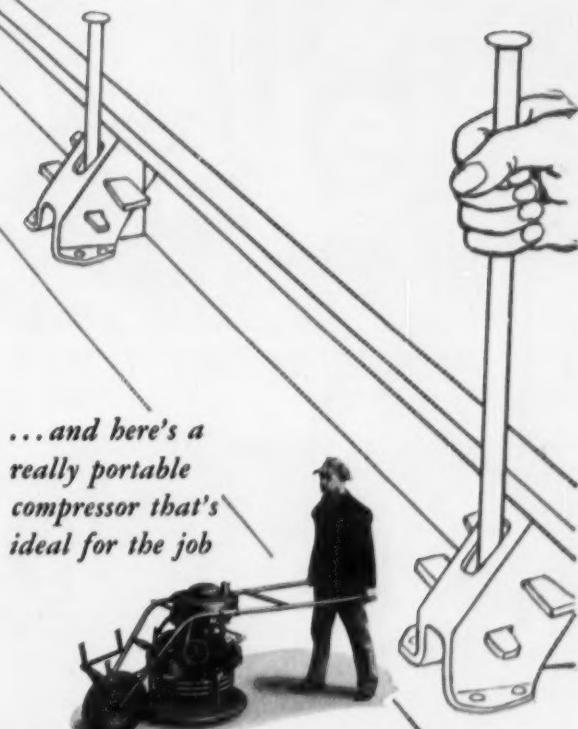
Ingersoll-Rand

11 Broadway, New York 4, N. Y.

CONDENSERS • GAS AND DIESEL ENGINES • TURBO-BLOWERS • ROCK DRILLS • COMPRESSORS • AIR AND ELECTRIC TOOLS

DRIVE FORM PINS

**as fast as
you can
set 'em!**



*...and here's a
really portable
compressor that's
ideal for the job*

The Ingersoll-Rand SPOT-AIR!

This completely self-contained, gasoline-engine-driven, 36-cfm air-cooled portable compressor, with wheelbarrow mounting, can be easily moved by one man, advancing along the roadbed as the work progresses. It has ample power to keep the PB-59 working at top efficiency—avoids tying up larger compressors that may be needed elsewhere on the job.

5-137



1 HERE'S THE PLYWOOD FORM in place ready to receive 3-in. wide Masonite strips. Notice curb construction with copper flashing. Form is pitched to permit water runoff.

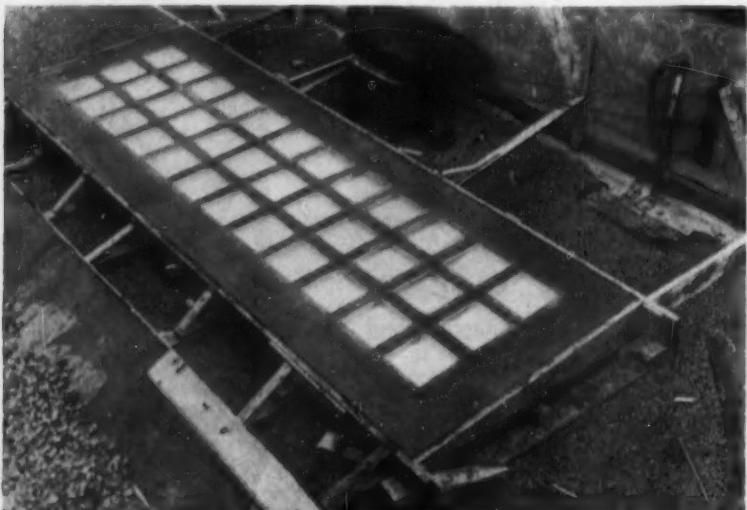


2 PREFORMED STEEL REINFORCING BARS, $\frac{1}{2}$ to $\frac{5}{8}$ in., depending on panel area, are wired to "chairs" to keep them about $\frac{1}{2}$ in. above the bottom of the panel face.

A Better Way to Install Glass Block



3 SANDBAGS ELIMINATE BLOCK DISALIGNMENT during vibrating. This procedure is a "must." Concrete is kept on the dry side with a 3-in. maximum slump. After initial set, concrete is troweled and brushed.



4 HERE'S THE FINISHED PANEL. After 7 days of wet curing at temperatures above 50 deg., the forms can be removed. The top faces of blocks are cleaned before curing.

GLASS BLOCKS for top lighting in new or remodeled construction projects, have long been under consideration, but because a good installation method has been lacking, relatively few architects and builders have specified them.

The Pittsburgh Corning Corp., Pittsburgh, Pa., contends now that its new block, called Skytrol, is an especially designed glass block for top lighting. It not only eliminates condensation, gives a soft diffused light, requires no maintenance, has twice the insulating efficiency of skylights, but also costs only \$4.50 to \$6.50 per sq ft to install. Installation is by casting the blocks into a rigid steel reinforced concrete grid. This method eliminates puttying, scraping or caulking. Installation can be either in flat or curved form.

The block measures $11\frac{3}{4} \times 11\frac{3}{4} \times 3\frac{1}{8}$ in. The top surface is smooth glass. The inside has a partial vacuum providing good insulation qualities. A fibrous glass diffusing screen divides the interior of the block into two dead air spaces that reduce heat loss or gain. The inner surfaces are stippled.

Pittsburgh Corning claims there are several easy ways to position the glass blocks and reinforcing rods in the form. To space the blocks, cut $\frac{1}{8}$ -in. hardboard to the exact width of the joints and nail it to the form. If hardboard is not handy, hold the block in place with two copper nails driven into place along each edge.

Reinforcing rods can be positioned by driving rust-free staples into the form to the proper height. Then wire the rods to these staples. This holds the rods in a firm grip,

Manitowoc 2000

dives for dollars



here are the “2000” features:

Faster Working Cycles
Faster hoist speed—swing speed

Efficient—Economical
Simple design—only 13
working gears

Greater Capacity
(45 ft. crane boom—50,000 lbs.)

Easily Converted
Shovel—Dragline—Crane—Hoe

Less Ground Pressure
6.9 to 13.0 lbs./sq. in.

Long, Wide Crawlers
12'4"—14'7"—16'10"

EVEN THOUGH it's up to its "travel shaft" in water—this Manitowoc 2000 is packed with profitable action! Assigned to handle the toughest part of a \$250,000 Washington State Highway Commission job for Cherf Brothers near Kennewick, Wash., this Model 2000 is slugging it out with rocks, boulders, clay, sand, gravel and water at the rate of 1000 yards per shift, sometimes working around the clock. Frequently this 1½ yd. rig has to submarine its oversize bucket to a depth of 9 feet under water to get its load!

A smooth functioning torque converter reduces load shocks and boosts operating efficiency. Jaw-type steering clutches and travel gear are fully enclosed—protected from water and dirt. These are the Manitowoc features that permit this kind of wet going.

Got a tough job? Let a Manitowoc take a crack at it—take your operation out of the "red" and end up each shift in the "black".





FOR A MOBILE TOWING RIG

TOwing heavy machinery calls for equipment built for the job . . . a job that Carco winches are specifically engineered to perform. For a Carco winch, through its rugged, constant mesh gear train, gives double the pulling or towing power of a tractor's drawbar pull. Equally as important, the increased "reach" of the Carco winch line provides valuable flexibility. With this Carco "reach" you can winch-in inaccessible loads . . . can lower or raise heavy machinery to and from spots the tractor can't go . . . can be safe against loss of tractor traction. See your nearest Carco dealer for more complete information. **PACIFIC CAR AND FOUNDRY COMPANY**, Renton, Washington. Branches at Portland, Ore., and Franklin Park, Ill.



WINCHES
For All Industrial
Tractors

GLASS BLOCK . . .

Continued from page 144

but the bottom ends of the staples must be clipped off after the form is removed. The rods may also be placed on small $\frac{1}{2}$ in. high concrete blocks. After the form is removed, paint will conceal any small joint marks.

Aggregate and Water Ratio

For the concrete mix, use the following table to obtain a $5\frac{1}{2}$ -gal paste:

GAL OF WATER PER SACK OF CEMENT:

- If sand is: very wet ($4\frac{1}{4}$) average wet ($4\frac{1}{2}$) damp (5)

• If the mix is not plastic and workable, change the proportions of sand and gravel slightly, but keep the total volume of aggregate the same.

• Steps should be taken to prevent the glass block from shifting while concrete is placed and vibrated.

• Vibrate each joint to insure compaction of the concrete, by using a small spud vibrator.

SALES AND SERVICE . . .

Continued from page 142

Newton, Iowa, and Kwik-Mix Co. of Port Washington, Wis. The Memphis address of the Dalrymple Equipment Co. is 2635 Summer Ave.

Euclid Division General Motors Corp.: The appointment of three new dealer organizations to handle sales and parts service in Texas has been announced by V. L. Snow, Director of Sales: In northeast Texas, Conley-Lott-Nichols Machinery Co., Dallas and Longview; in south Texas, Ingram Equipment Co., with headquarters in San Antonio and branches in Houston, Corpus Christi, Edinburg and Austin; in west Texas east of the Pecos River and the Pan Handle, Conley-Lott-Nichols of West Texas with headquarters in Lubbock and branch in Odessa.

Taylor-Forge & Pipe Works: L. B. Foster Co., Pittsburgh, Pa. has been appointed exclusive national distributor of Taylor-Forge spiral-weld foundation piles in 46 states, and a distributor in Texas and California. Supplied in a number of lengths and wall thicknesses, this piling is driven without mandrel and is said to have a greater collapse strength than a seamless pipe.

Hensley Equipment Co.: Recently appointed the following equipment stores as exclusive dealers in their area for the company's line of dozer and scraper attachments and cutting edges: Holz Co., Ukiah, Calif.; Westside Tractor & Equipment Co., Willows, Calif.; Emerson-Braden Co., Colusa, Calif.; Roshoit Equipment Co., Minneapolis, Minn.; Bark River Culvert & Equipment Co., Eau Claire, Wis.

Detroit Diesel Engine Division, General Motors Corp.: W. R. Bays, former Kansas sales representative of the Detroit Diesel Engine Division, has been appointed distributor for

GM Diesel engines in western Kansas. The new distributor has taken over the facilities of Detroit Diesel's former distributor, the Diesel Equipment of Wichita and Great Bend, and the business will continue at the same locations under the same firm name.

LeTourneau - Westinghouse Co.: South Texas Equipment Co., Inc., 5500 Navigation Blvd., Houston, Tex., with branch at 3406 Roosevelt, San Antonio, Tex., has been appointed distributor for lower Texas for the company's line of high-speed, rubber-tired construction equipment. R. P. Doherty is president and Dave Boren is vice-president.

On the Sales Front

Gradall Division, The Warner & Swasey Co.: Ray L. Clever, service manager for Gradall since 1951 in Cleveland, has been appointed Cleveland territory representative for this company. Mr. Clever will serve an area including Ohio, Indiana, Kentucky, Michigan and most of Ontario, Canada.

Harnischfeger Corp.: T. H. Rutherford has joined the Harnischfeger Corp. to direct the sales of the Sierra Loader, recently purchased from the C and D Manufacturing Co. by this company. Mr. Rutherford, who has spent more than thirty years in the earth-moving business, will make his headquarters in Milwaukee.

American Chain & Cable Co., Inc.: Warren W. Runkle has been appointed New York-New England district sales manager for the Wire Rope divisions. His headquarters will be at 230 Park Ave., N.Y.

Hewitt-Robins Inc.: Harold E. Murken has been appointed manager of conveyor system sales. He will be located at Chambers Street and will coordinate activities of the general

(Continued on page 148)

(Advertisement)

One of 17 A-C tractors, with Gar Wood dozers and cable control units, used by Yonkers Contracting Co. on their Maine Turnpike Contract.



Dozing on the Turnpikes from Maine to Ohio!

S. J. Groves & Sons Co. rip into tough going with Gar Wood equipped HD-20 on Ohio Turnpike contract.

Work on the big, new superhighways is in high gear this summer with contractors moving mountains of earth on projects throughout the country. As usual Gar-Wood dozers on Allis-Chalmers tractors fitted with Gar Wood cable control units, are handling a big share of the earthmoving on these major construction jobs.

Up in Maine, work is progressing on the second section of the Maine Turnpike — another high-speed, four lane divided highway running from Portland to Augusta.

On a contract for grading and draining an 11 mile stretch outside the twin cities of Lewiston-Auburn, Yonkers Contracting Co. is using 15 big Allis-Chalmers HD-20s and 2 HD-15s, all Gar Wood equipped, for stripping and spreading fill on the job. Over 3,000,000 yds. of dirt and 100,000 yds. of rock are involved in the contract.

In the photo at top, Yonkers Contracting Co. uses one of their 17

tractors, with Gar Wood dozers and cable control units, to spread fill for compaction by a sheepfoot roller pulled by the same tractor.

Moving westward, contractors on New Jersey's tremendous new Garden State Parkway, from Cape May to the New York state line—and on the 500 mile New York Thruway, are using fleets of Gar Wood equipped Allis-Chalmers tractors in an effort to rush completion of the majority of the work by the end of the current working season.

In Pennsylvania preliminary work on extensions to the Pennsylvania Turnpike is underway and digging and dozing is swiftly progressing along the entire length of Ohio's big, new \$283 million Turnpike.

In the photo at left, S. J. Groves & Sons Co. use one of their many

Allis-Chalmers HD-20s, equipped with Gar Wood dozer and cable control unit, to rip into sandy clay, clogged with tree and shrub roots, along the right-of-way of their 12.9 mile, 1,750,000 cu. yd. contract. Groves is only one of the many contractors using Gar Wood equipment on these vital toll road links between the Atlantic Seaboard and Chicago.

When there is earthmoving to be done, contractors everywhere specify Gar Wood! 15 dozer models, designed for both cable and hydraulic operation, are available for all Allis-Chalmers crawler tractors. Gar Wood's dozer line is supplemented by a complete line of front and rear mounted cable control units for any dozer-scraper operation.

GAR WOOD INDUSTRIES, INC.

TRACTOR EQUIPMENT SALES • WAYNE, MICHIGAN



M-4029 N

SALES AND SERVICE ...

Continued from page 146

sales organization and the engineering department. He also will work on special assignments for F. L. Griffith, general sales manager of the conveyor and rubber divisions.

E. I. DuPont De Nemours and Co.: Richard D. Hedreen, assistant manager of the Chicago sales office of the DuPont Co.'s Explosives Department, has been named manager of the department's technical service section whose members act as consultants to government and industry on technical problems in the explosives field and assist in unusual blasting operations all over the United States.

All-State Welding Alloys Co., Inc.: Harry G. Peacor of Portland, Ore., has been appointed regional manager to cover all the states of Oregon, Washington, Idaho, Wyoming, and Montana, northern California, and western Canada.

Electric Steel Foundry Co.: Has appointed R. W. de Weese vice-president in charge of sales, and Jefferson J. Davis vice-president in charge of product divisions.

Leschen Wire Rope Division, H. K. Porter Co., Inc.: Herbert L. Waltman has been named manager of the Pacific Northwest district covering Washington, Oregon, western Idaho, Montana and North Dakota, with headquarters in Seattle.

Bucyrus-Erie Co.: The new general sales manager for this company is Lawrence E. MacDonald who will take over responsibility for all domestic sales.

Marlow Pumps Division, Bell & Gossett Co.: F. R. Paris has been appointed assistant sales manager, assisting Sales Manager A. F. Woods with sales policy and directly supervising all Marlow Division district engineers west of the Mississippi.

Gar Wood Industries, Inc.: C. W. Snider has been made assistant to E. B. Hill, director of sales, assisting in the administration of sales and marketing functions for all Gar Wood products.

Osgood-General: Appointment of Don R. Williams of Portland, Ore., as division sales manager for Oregon, Washington and British Columbia has been announced by Kenneth Williamson, general sales manager. Mr. Williams will work with and through Osgood-General distributors in his area, including Western Equipment Co. offices in Portland and

Eugene, Washington Machinery Co., Inc., in Seattle, and Columbia Equipment Co., Ltd., in Vancouver, B.C.

Buffalo-Springfield Roller Co.: Ben E. Lingenfelter of Salt Lake City, Utah, has been appointed western district representative for the complete line of Buffalo-Springfield road-roller compaction equipment in states west of the Mississippi. His headquarters will be in Salt Lake City. Also appointed was Charles W. "Mark" Anthony as eastern district representative to serve distributors and their customers in all states east of the Mississippi.

Twin Disc Clutch Co.: Has announced the following sales department appointments: R. C. McRoberts, assistant sales manager, Hydraulic Division; J. B. Schubeler promoted to manager, Export Sales; and E. H. Bennett, district manager for the Dallas (Tex.) branch.

In the Main Office

Blaw-Knox Co.: Robert P. McKenrick has been promoted to vice-president - general manager of the Blaw-Knox Co.'s newly formed Construction Equipment Division at Mattoon, Ill. The new plant will be the sales and manufacturing headquarters of the Construction Equipment Division, as well as the division's manufacturing center.

Special Mention

The Tew Shovel Co.: Arrangements have been completed for purchase of the controlling stock of Dixie Crane and Shovel Co., Inc., of Harrisburg, Pa., which gives the company an entree into the lowcost crawler and rubber-tire mounted, $\frac{3}{4}$ -yd., 6-ton shovel-crane market. The Dixie Crane line will continue to be manufactured and distributed by Dixie Crane, under that brand name.

Association Activities

Portland Cement Assoc.: G. Donald Kennedy, for the last $1\frac{1}{2}$ years executive vice-president of the Portland Cement Association, is the new president. He succeeds Carl D. Franks, who retires after 38 years of service with the Association. Mr. Kennedy joined the Association in January, 1950, as consulting engineer and assistant to the president. He was appointed executive vice-president in May 1953.

American Institute of Steel Construction: Earle V. Grover, president of Apex Steel Corp., Ltd., Los Angeles, Calif., is the new president elected at the 32nd Annual Convention, which was held at White Sul-

phur Springs, W. Va. He succeeds John E. Jackson, president of Pittsburgh-Des Moines Steel Co., of Pittsburgh, Pa. Other officers elected: N. P. Hayes, president, Carolina Steel and Iron Co., Greensboro, N.C., first vice-president; H. Buckley Dietrich, president, Dietrich Brothers, Inc., Baltimore, Md., second vice-president; James M. Straub, president, Fort Pitt Bridge Works, Pittsburgh, Pa., re-elected treasurer; and M. Harvey Smedley, New York City, secretary.

Portland Cement Assoc.: Emory M. Ford, Chairman of the Huron Portland Cement Co., Detroit, Mich., was elected chairman of the Board of Directors of the Portland Cement Association at its annual meeting in Chicago. Mr. Ford has served the Association as a member of the Board of Directors for the last 11 years and as a member of the Executive Committee for the last year. Two new directors also were elected: H. B. Robeson, president, Nazareth Cement Co., Nazareth, Pa., and James H. Ackerman, president, Dragon Cement Co., Inc., N.Y.

Reinforced Asphalt Fails on Turnpike

THE $4\frac{1}{2}$ -MI STRETCH of the Pennsylvania Turnpike that was resurfaced last summer with reinforced bituminous concrete failed in several areas and had to be stripped. Welded wire fabric had been laid directly over the old concrete pavement and covered with a 2-in. binder course and a 1-in. surface course. (See p.126, Oct. '54)

A few months after the resurfacing was applied, pot-holes and raveling occurred over the surface. In October, the entire length had to be removed.

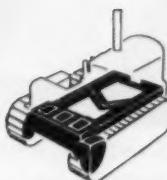
Opinions vary on the cause of the failure. One group claims that the $1\frac{1}{2}$ -in. aggregate in the mix was too large to allow the fabric to raise up into the binder material. They point out that voids could have formed between the concrete and asphalt, picked up water, and deteriorated the resurfacing.

Other technicians believe, however, that the aggregate was not a major factor. They estimate that the method would have been more effective if a thin leveling course had been laid first, covered by fabric, and then topped with a thick binder course.

At any rate, engineers agree that much more research must be conducted on the uses of welded wire fabric in asphalt.

Why the HD-5 gives you EXTRA DOZE-ABILITY

Here are reasons why more and more builders are choosing the popular Allis-Chalmers HD-5 Tractor for all kinds of dozing jobs—from land clearing to landscaping.



Built with Dozing in Mind The HD-5 is the only crawler in its weight and power class that is *new* in design and built with dozing in mind. The engine is not used as a structural member. Instead, weight and working stresses are carried by a full-length, all-steel welded

main frame. This type of frame allows closer mounting of the blade, reduces front-end overhang for better balance, permits more direct down pressure on the blade, eliminates bulky track-straddling frame that often clogs up. The HD-5 is built to stand the gaff in clearing land, building streets — any heavy dozing.



Works Anywhere, Any Time Crawler design features large idler and sprockets, puts more track on the ground for better traction in soft, mucky ground — as in digging drainage ditches or filling in low, swampy areas. Plenty of weight, with low center of gravity, also helps assure good traction for all dozing.



Compact for Tight Places Only 5 ft, 1 in. high and less than 13 ft long, including blade, the HD-5 packs a lot of dozing punch (50 belt hp) in small space—works easily between houses, around poles and trees, any narrow quarters. Double reduction final drive allows ample 11½-in. ground clearance.



Smooth Hydraulic Blade Control makes it easy for the operator to work all day without undue tiring effort, permits the accuracy needed for finish grade, working close to manholes, other objects. Full vision, simplified shifting, convenient controls, easy steering — all help the operator get the most work done with the least effort.



Quickly Hauled Job-to-Job by truck or small trailer, the HD-5 might be backfilling trenches on one job and a short time later be at another location several miles away excavating or cutting drainage ditches.



Maximum Work Time, Minimum Down Time Unit construction allows removal of major assemblies such as engine, clutch, transmission, steering clutches or final drive without disturbing adjacent assemblies, for big saving in down time — accessibility saves time for inspection, adjustment and servicing — exclusive 1,000-hour lubrication interval for truck wheels, idlers and support rollers cuts greasing time.



Write for literature giving more information — or let your Allis-Chalmers dealer show you how the HD-5 does outstanding work on all types of dozing. He will be glad to demonstrate right on your own job.

50 belt hp, 11,250 lb (bare tractor)



ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U.S.A.

CONSTRUCTION EQUIPMENT NEWS



High-Lift Hydraulic Hoist

The American Economobile is a new heavy-duty, high-lift hydraulic hoist designed for use by masonry and general contractors. Equipped with pallet fork, the Economobile hoists up to 2,500 lb in excess of 17 ft. With an auxiliary tower, it can serve heights up to 22 ft. With a 14-cu ft cement bucket the unit can pour concrete walls. With a chain boom, it can be used to place light structural steel.—**American Road Equipment Co., Omaha, Neb.**



King-Size Front-End Loader

This huge Mixermobile front-end loader, equipped with a 10-cu yd bucket dwarfs its baby brother of 1-cu yd capacity. It features 4-wheel planetary drive, 4-wheel steering, and hydraulic operation. It's diesel powered and has a top speed of 16 mph. It's intended for lightweight materials.—**Mixermobile Manufacturers, 8027 N.E. Killingsworth, Portland, Ore.**



Diesel-Electric Wagon Crane

First of a new series of diesel-electric cranes by Brownhoist is this rubber-tired, 30-ton model. It is powered with a diesel engine rated at 165 hp. It employs both electric travel and rotation. The boom on this machine is 60 ft. The new wagon cranes, manufactured in 25- to 60-ton capacities, will be mounted on a 12-wheel crane capable of speeds up to 8 mph.—**Industrial Brownhoist Corp., Bay City, Mich.**



3/4-Cu Yd Shovel

Taking the place of the Link-Belt model LS-52 is this new model LS-68, a light $\frac{3}{4}$ -cu yd shovel-crane. It features a heavy-wide lower frame with large 10-in. dia heat-treated steel single flange track rollers, mounted on $2\frac{1}{2}$ -in. dia shafts. Weight of machine is 35,300 lb as a standard shovel. The crawler base rig is fully convertible to all standard front-end attachments. Six conical hook rollers, two pair in front and two in the rear are standard. — **Link-Belt Speeder Corp., Cedar Rapids, Iowa.**

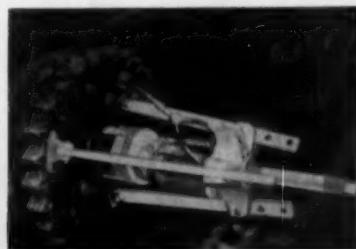
On-the-Job Previews of Machinery, Tools and Equipment



New Barber-Greene Ditcher

A new 4-wheel drive, truck-mounted ditcher, Model 711, has been added to the Barber-Greene line. The unit has a 45-mph road speed and will dig down to 5 ft, depending on type of boom selected. Digging widths vary from

8½ to 18 in. Forward speeds range from zero to 13 ft per min. The machine controls can be operated from the cab or from the ground. The operating over-all height is only 6 ft 8 in.—**Barber-Greene Co., Aurora, Ill.**



Sprocket Puller

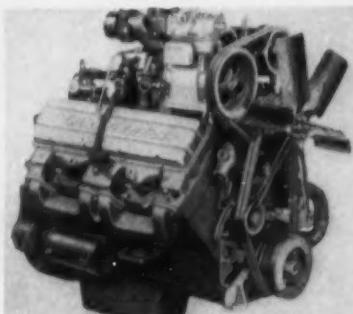
The tough maintenance job pulling and installing drive sprockets on crawler-type tractors is made easy with this OTC 100-ton sprocket puller. Electrically or hand-operated pumps may be used.—**Owatonna Tool Co., 380 N. Cedar St., Owatonna, Minn.**



Euclid S-7 Scraper in Service

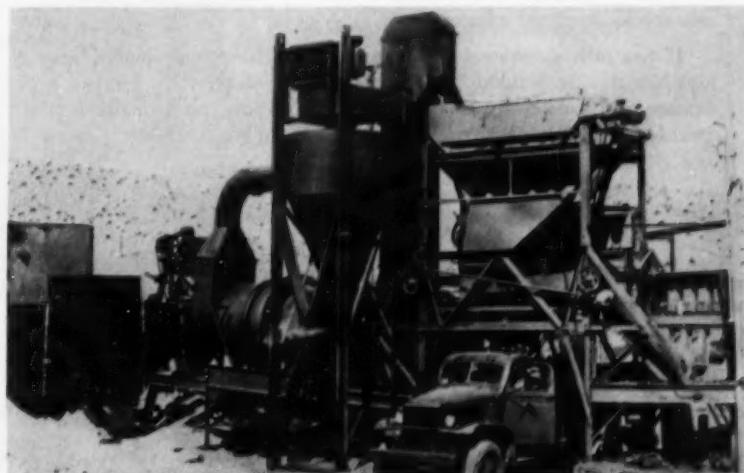
R. J. Boe Construction Co., of Seattle, Wash., took delivery on one of the first Euclid S-7 scrapers and reports heaped loads up to 9 cu yd. Powered with General Motors 138-hp, "4-71" diesel engine, the unit has speeds from 2.7 up to 24.8 mph. It will make non-stop 26-ft turns, 90 deg, right or

left, and has full power steering. It weighs 25,000 lb empty. A Fuller 5CB-650, 5 speed forward and one reverse transmission is used. Wheelbase is 17 ft 7 in. with over-all width at 8 ft. Dumping angle of ejector is 70 deg.—**Euclid Division, General Motors Corp., Cleveland 17, Ohio.**



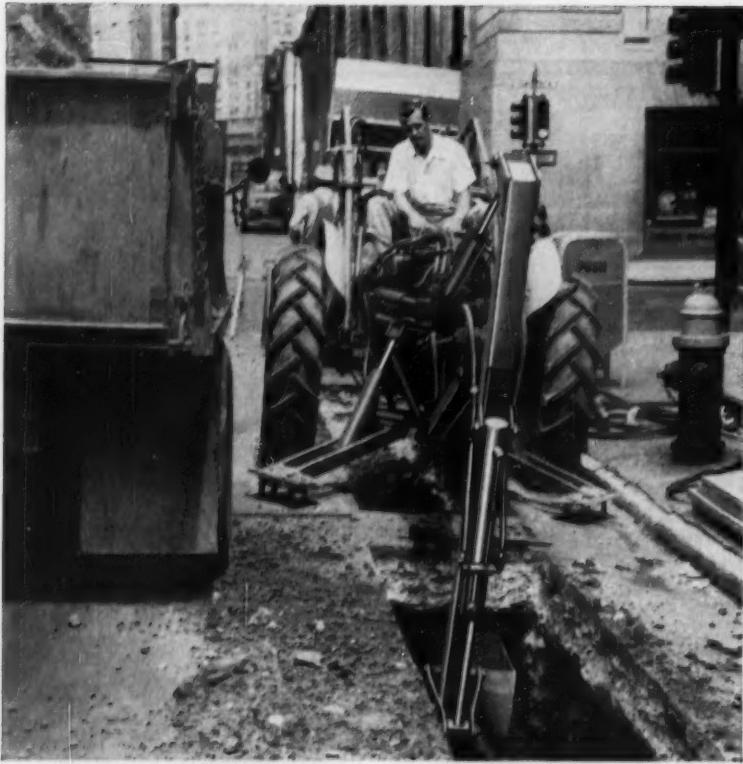
New Continental Family

High power-to-weight ratio and compactness feature the new family of heavy-duty V8 engines just announced by Continental Motors. Model V8603 is a 240-hp gasoline engine and model VD8603 is a 182-hp diesel. New models are shorter and narrower.—**Continental Motors, Muskegon, Mich.**



Portable Asphalt Plant

This portable batch-type asphalt plant, the Standard TM Portable, is designed for use in areas where larger plants cannot be erected and operated profitably. It can be hauled anywhere and erected in 2½ hr. It's mounted on heavy-duty tires as a tractor-type trailer hitch. Air connections permit the unit to be moved with a semi-type truck-tractor. Controls are simplified so one man can run entire plant from a central location.—**Standard Steel Corp., 5093 Boyle Ave., Los Angeles, Calif.**



Make Emergency Repairs Faster with a Sherman Power Digger!

The job: Break up 3" of asphalt and 8" of concrete with air tools, then dig bellholes 5 feet deep for repairs to underground conduit. The location: A busy street, where traffic congestion must be kept to a minimum, repairs made, and the street re-paved for traffic to resume as soon as possible.

The solution: A Sherman Power Digger. Its actuated shovel action made it possible to dig an under-cut bellhole to the required depth with a small surface opening, thus keeping later street re-surfacing cost to a minimum. The tractor-mounted digger traveled to the site under its own power, dug at a fraction of the cost of hand labor, and saved considerable time by loading spoil directly into trucks from the excavation.

If you now excavate by hand or with machines too clumsy for jobs like this, investigate the Sherman Power Digger. It's compact, flexible, fast, easy to operate. It costs little to buy, less to maintain, quickly pays for itself. Write today for Bulletin No. U-58.

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Royal Oak, Michigan

WAIN-ROY CORPORATION
Hubbardston, Mass.

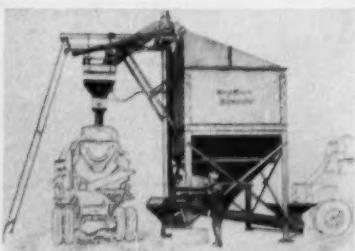
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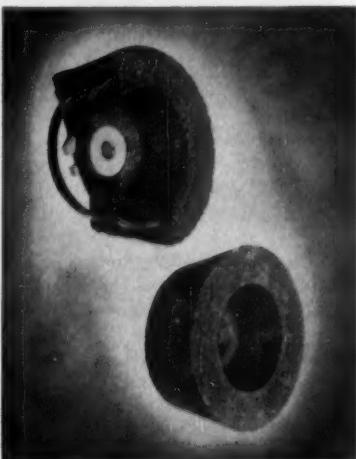


EQUIPMENT NEWS . . .

Continued from page 151



SCREW ACTION BATCH LIFT—A new batch-lift design with a fast screw-action lift, low bin and automatic batcher for higher capacity, greater accuracy and easier portability has automatic push-button controls, make batching faster and more accurate. It is totally self-contained with its own compressor for actuating the automatic controls, and has its own electric motor or gas engine. All air and electric lines are permanently installed so there is little chance for connections to break when the unit is moved. Called the WeighMeister it is easy to load and unload, requiring no dismantling and reassembling. It is available with either a 225- or 300-bbl bin.—**L. Burmeister Co.**, Milwaukee, Wis.

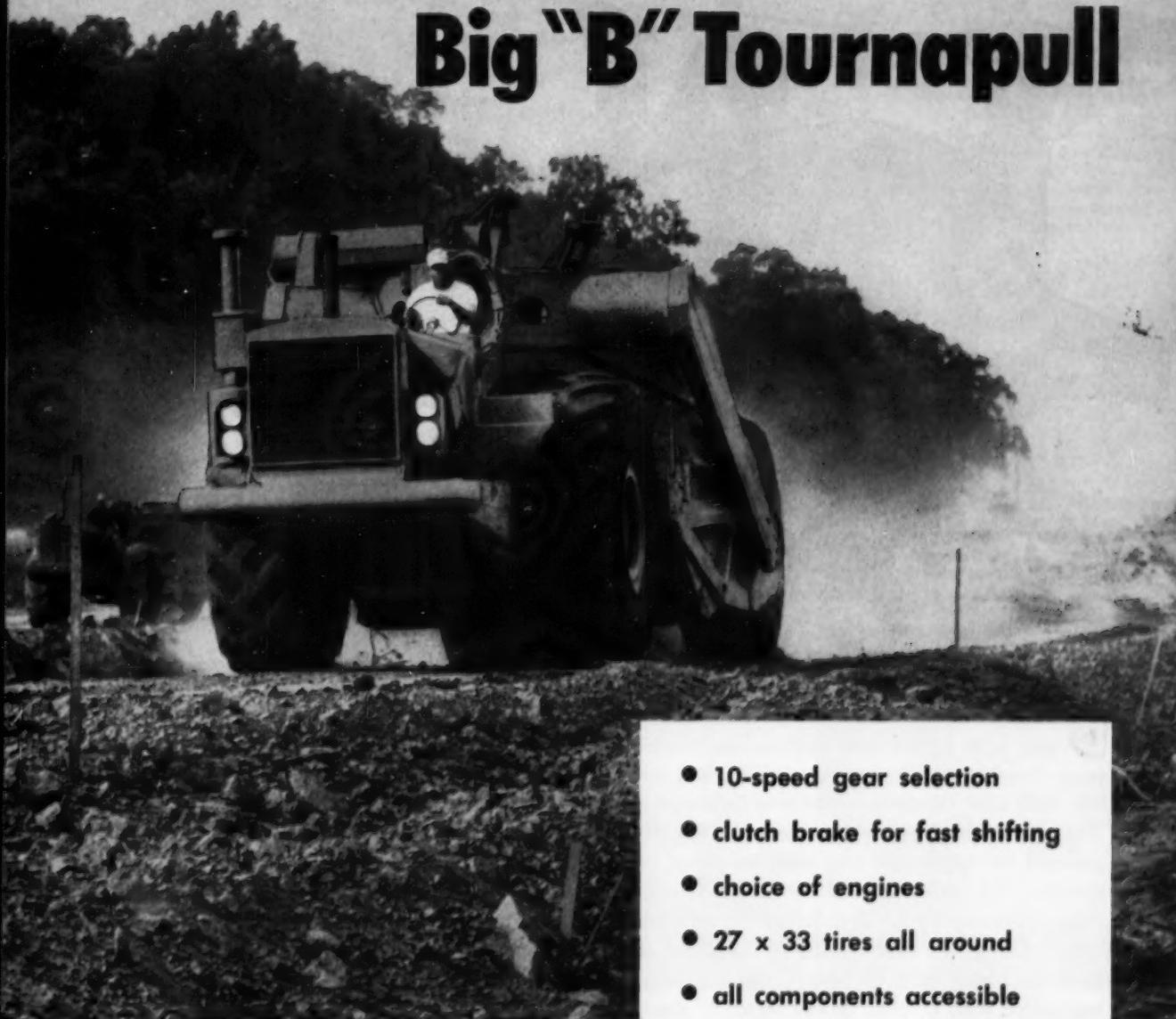


SAFER GRINDING WHEEL—A grinding wheel designed to increase the safety factor contains two safety rings embedded directly in the usable portion of the wheel. These rings have greater tensile strength than steel and at the same time will abrade away from the normal cutting of the wheel without any interference with the grinding action. Tests conducted by users of the new wheel, which is called Colonial Grind-Away safety rings show that cracked wheels have been run up to 20% above normal operating speed without explosion of the wheel.—**Colonial Abrasive Products Co.**, Conshohocken, Pa.

NEW

**18 yds. struck
23 yds. heaped
without sideboards**

Big "B" Tournapull



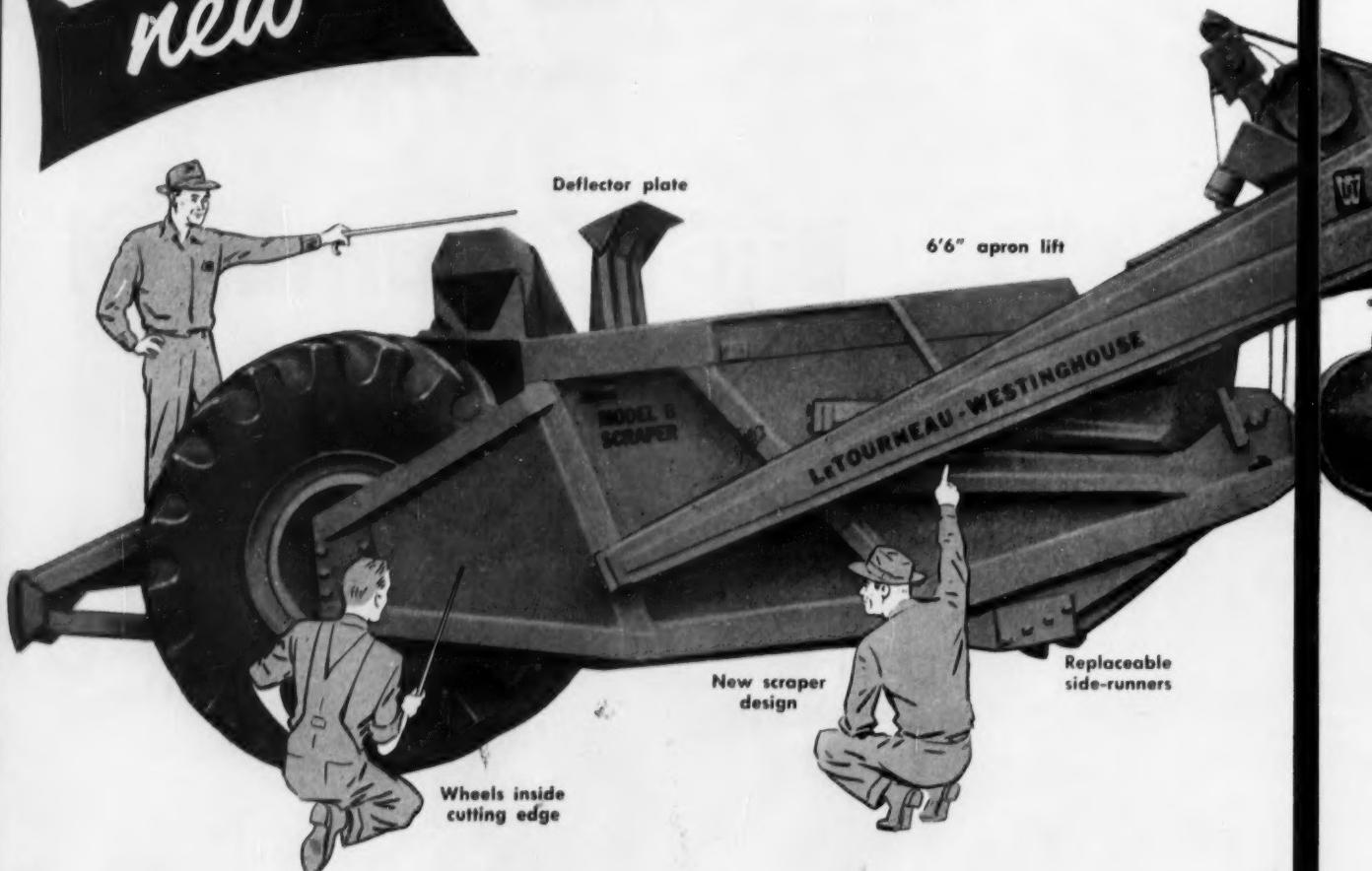
- 10-speed gear selection
- clutch brake for fast shifting
- choice of engines
- 27 x 33 tires all around
- all components accessible
- "feather-touch" power steer

See following pages for details
on this big new scraper



*Brand
new -*

from the ground up...the

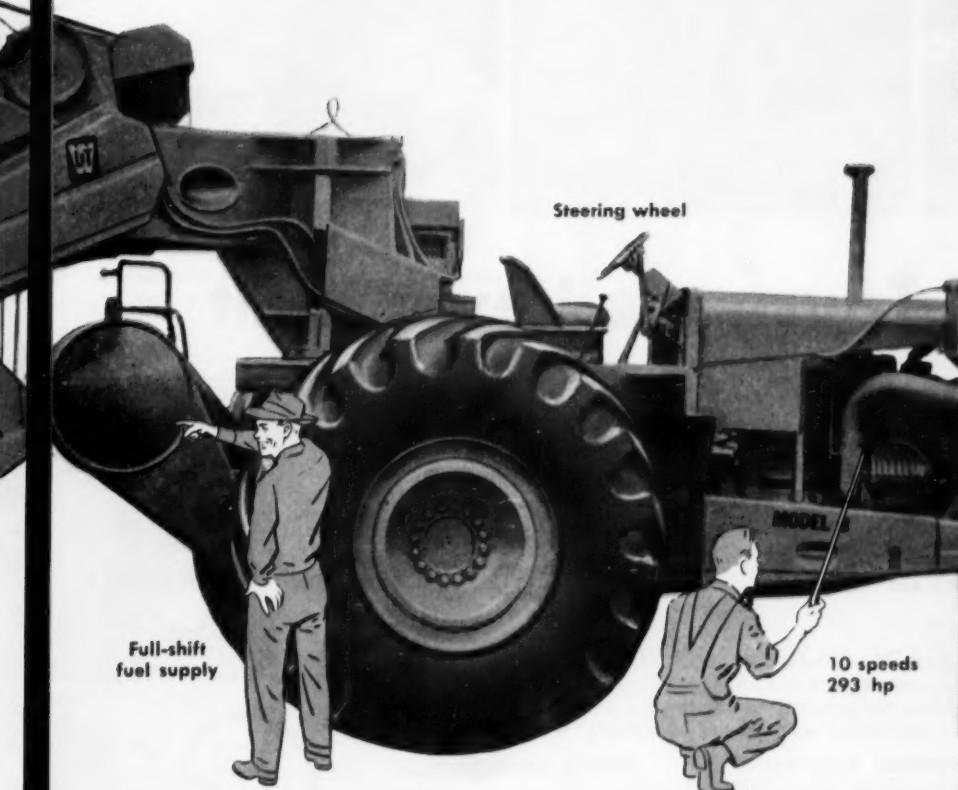


BTOURNAPULL is the first machine completely designed and built by the new LeTourneau-Westinghouse Company. Developed by our new engineering and research staff, it was built after careful study of today's scraper requirements. The *new* Model B prime-mover is a big, powerful tractor engineered for quick and easy replacement of component assemblies. All major assemblies — transmission, clutch, final drive, differential, etc. — can be lifted from the machine without necessity for time-consuming handling of other components. Every part of both prime-mover and scraper is engineered with a "plus" safety factor to give you the most rugged scraper unit ever built. Prototypes of the "B" were put through rugged tests on our new proving grounds. They were then tested on-the-job by leading contractors in all types of materials under rugged field conditions. The new LeTourneau-Westinghouse Company has carefully and thoroughly designed, tested and job-proved this new "B" Tournapull before putting it into production.



Biggest single-engine self-propelled scraper on the market. "B" packs in 18 cu. yds., struck, or 23 cu. yds. heaped, *without sideboards*. New scraper design makes for easy loading. Proper weight distribution that puts 56% of loaded scraper weight on drive wheels, plus 293 hp of diesel power, help get heaped loads in a hurry. You have a choice of Cummins or GM engines for standardization with other equipment in your fleet.

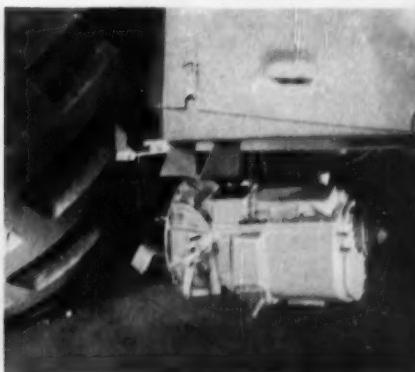
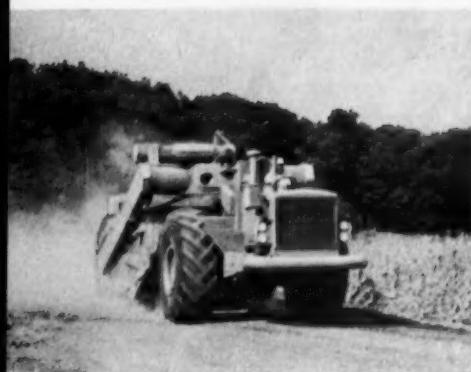
new 23-yd. B Tournapull



Faster, easier loading is a feature of brand new scraper design based on 36 years' scraper building experience. Blade is correctly angled for most efficient cutting action. Newly-designed push-block connects with scraper bottom as well as side sheets. This gives direct action to utilize full power of push-tractor for faster easier loading. Deflector plate at rear of bowl and curved apron provides easy boiling action. Scraper wheels track inside cutting edge. Apron lifts 6'6" to permit free ejection of any material. Cables are short. Welded box-beam construction increases strength, lowers deadweight.



Large tires (27.00 x 33, 30 ply) used all around provide ample load-carrying capacity without overloading. Tires and wheels are interchangeable between prime-mover and scraper. One spare serves your entire fleet.



Ten gear ratios allow you to select working speed best suited to underfoot conditions. Low gear matches pusher speed, enables "B" to help itself in loading . . . gives full lugging power for pulling through soft going. Clutch brake permits fast shifting without gear clashing. No double-clutching is necessary. This combination of 10 speeds, plus clutch brake for fast shifting, means hauling at higher speeds . . . more trips per hour.

Instant-response, positive electric controls are simpler and trouble-free. New feather-touch power-steer gives you feel of the road. Tailgate and apron are controlled by a single control switch. Tailgate moves forward automatically as soon as apron reaches full raised position. All electric motors, including steering motor, are in the open for easy adjustment when necessary. Electric controls enable operators to do better work all day long.

Easy accessibility of all components facilitate quick servicing and repair. Disassembly is easy. For instance, you can drop transmission in less than an hour without pulling engine. Bolt sizes are held to a minimum. Quick disconnects are used wherever possible. Drain and fill plugs are easily accessible. Number of lube points and types of lubricants are reduced to lowest practical limits. Large fuel tank with ten-hour supply is provided.

This B Tournapull was tested on a road job near Monee, Illinois. Unit was later shifted to a section on Indiana Turnpike. All test models were given punishing treatment so trouble spots would show up for correction.

"B" shown here hauled sand and tough lower-magnesium limestone on highway work at Hager City, Wisconsin. Big 4-wheel air brakes (7536 sq. in. total brake surface) and power steer provide ample safety margin.

Another new "B" prime-mover gets additional testing on installation in West Virginia. Its 35-ton Rear-Dump trailing unit is interchangeable with the 23-yd. Scraper described on this and preceding pages.



The best Tournapull ever built

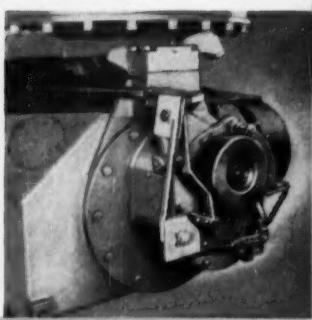


90° turns

Despite its size, the "B" machine can turn around non-stop in space 35' wide. Its 90° maneuverability will pay off in narrow cuts and fills.

Positive parking brake

Simple brake on output shaft of transfer case gives you safe, sure parking. Brake is mounted out in open for quick adjustment. Parts are few.

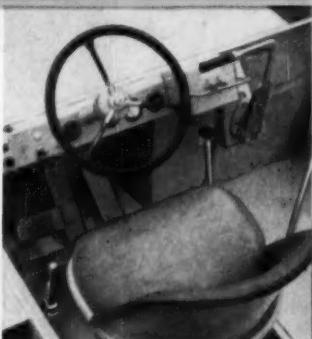
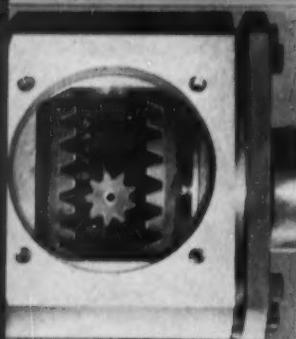


Power-transfer differential

A "B" plus that no competitive dirtmover can match is the exclusive power-transfer differential. Unit automatically keeps power flow equal and constant to both drive wheels . . . prevents spin of wheel on poor footing. "B" keeps going through soft fills and soggy cuts where other machines hang up.

Simple operation

Controls are few in number. Lever to right of steering wheel raises and lowers bowl. Single pushbutton control synchronizes apron and tailgate action. Other levers are shift lever, transfer case lever, and hand throttle. Floor pedals operate accelerator, clutch, and brake. Starting is by dashboard pushbutton.



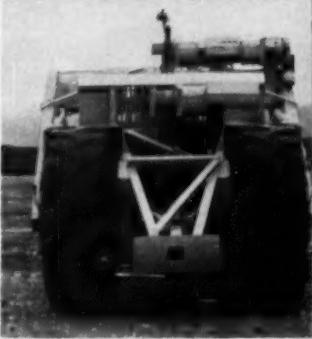
Instant bowl drop

Quick-release allows gravity drop of bowl, but retains efficient electric controls for hoisting. This enables you to "pump" loads . . . work effectively in sand and other loose materials . . . keep material boiling for big loads. Precision control by electricity lets you adjust bowl height within fraction of inch for accurate loading, spreading.

Better pusher contact

Push-block is low to direct push-tractor's thrust efficiently straight to blade. Block is rigidly reinforced.

Details shown on this page are only a portion of the many design features you'll find in this "new from the ground up" prime-mover and scraper.



Tournapull—Trademark Reg. U.S. Pat. Off. BP-767-G

Find out all about B Tournapull. See it work. Analyze its speed and production possibilities. Study the flotation and maneuverability of this new machine. Compare price per yard of capacity. Before you buy be sure you check all details on the new LeTourneau-Westinghouse B Tournapull. It's available now!

LeTourneau-Westinghouse Company
PEORIA, ILLINOIS

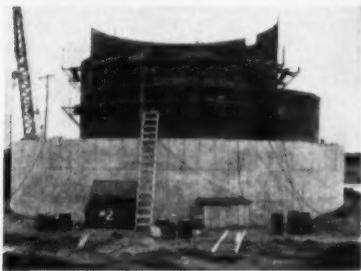
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Prefabricated Form System Used For All Types of Construction Saves Time . . . Labor . . . Material

UNI-FORM Concrete forms are widely used in all types of concrete construction because they provide contractors with three important advantages: (1) Increased labor productivity — forming crews can erect more contact area per man hour; (2) Guaranteed material and labor savings and (3) Complete flexibility of application.

Simple mechanical assembly of plywood faced, steel-framed UNI-FORM Concrete Forms permits any labor force to become expert in a short time. All forming requirement — inside corners, outside corners, pilasters, one-side align-



Circular wall formed with UNI-FORM Panels

ment and bracing, automatically accurate wall widths, scaffolding, etc. are engineered into, and provided with, the UNI-FORM System.

Contractors using the UNI-FORM System have the basic equipment to handle any type of concrete construction. Complete engineering service . . . job analysis, forming recommendations, bills of material and forming details, together with field service are available to contractors through the manufacturer, Universal Form Clamp Co., Chicago, or through any of the company's many Distributor or Branch Offices.



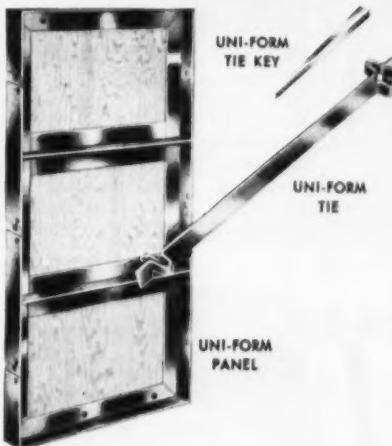
Battered wall forming with UNI-FORMS

A complete catalog, describing the UNI-FORM System of Wall Form Construction is available upon request. Write: Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill.

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**3 BASIC ELEMENTS mean
Faster, Easier, More Accurate Forming**



Simple mechanical assembly of UNI-FORM Concrete Forms provides faster forming . . . easier stripping and lowest all around costs. Ready to use when they reach the job, UNI-FORMS guarantee time, material and labor savings on any forming job. Let us prove UNI-FORM advantages . . . send us a set of prints for free recommendation and proposal on your next job. There's no obligation.

FORM CIRCULAR WALLS AT LOWEST COST

- No alignment or bracing on outside.
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- Free working area.
- Maximum job safety.



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PREFABRICATED CIRCULAR WALL FILLER

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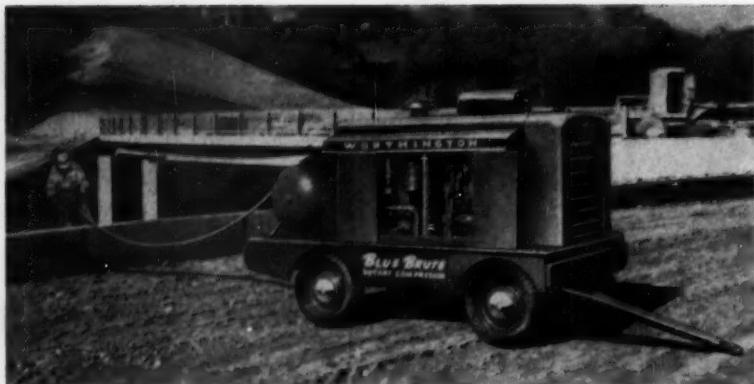
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The FINEST in
SURVEYING
EQUIPMENT

**KERN
INSTRUMENTS INC.**

120 Grand St., White Plains, N. Y.



NEW COMPRESSOR—New for the construction industry is a rotary-type compressor to be announced shortly by Worthington. It will employ several new design principles and features. Among these is a hydraulically operated clutch that lets the engine warm up before the compressor is cut in. A patented inter-

locking control valve on the clutch allows the engine to warm the compressor oil and immediately lubricate the moving parts when this clutch is engaged, permitting easier cold-weather starting. The new compressor will be available in 315-cu ft capacity.—Worthington Corp., Harrison, N.J.



HI-SPEED SAW—A low-priced hi-speed chain saw incorporating a 3.5-hp gasoline-driven, two-cycle, air-cooled engine features a specially tempered 16-in. guide bar. Its design includes large grip-size handle bars, an automatic clutch, float-type carburetor, rewind starter with nylon rope, and a balanced pressure frame. The saw can also be supplied with 18- and 24-in. bars and chains.—Lancaster Pump & Mfg. Co., Inc., Lancaster, Pa.



MALL CHAIN SAW—This 29-lb chain saw features dynamic power, sturdy construction, lightning cutting speed and balanced lightweight design and engineering. The Mall Model 1MG will cut through hard, soft, wet

or frozen wood. It has a 3½ brake hp, single-cylinder, two-cycle, air-cooled gas engine and is lubricated by mixing oil with gasoline. The cutting bar comes in five sizes—18, 24, 30, 36 and 42 in. and swivels 360 deg to allow cutting at any angle. The saw is priced at \$265 complete with engine, transmission and 18-in. bar and chain.—Mall Tool Co., 7725 S. Chicago Ave., Chicago 19, Ill.



COPPER BENDING SET—A compact set of tools for flaring, cutting and bending copper tubing from 3/16 to 5/8 in. in seven sizes of standard thin-wall untempered tubing is now available in a handy metal case. It contains flaring tool, a tubing cutter with a capacity of from 3/16 to 1 in. and set of six spring steel coiled sleeves which permit bending copper tubing from 1/4 to 5/8 in. without collapsing or buckling the tubing.—Owatonna Tool Co., 380 N. Cedar St., Owatonna, Minn.

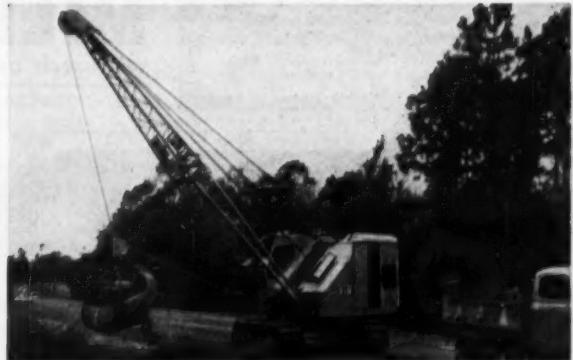


P&H Truck Cranes — two of many that gave a cost-cutting assist on the New York Thruway.

Better ideas are cutting costs



P&H 255-ATC, and a 655-B hoe team up in New Jersey.



P&H 255-A dragline cuts clean-up costs in Georgia.

P&H shows how on road jobs . . . everywhere

Looking for the newest ways to cut costs on highway jobs? Look at P&H — for here's the big selection that lets you pick *exactly* the right machine for any job. P&H Truck Cranes range from 7- to 35-ton capacity . . . crawler machines up to 3½ yds.

Every last one of them is completely modern — built around better basic ideas — not worked-over holdovers from the past. Here's all-welded construction — strength without excess weight . . . greater stability — to use full power more effectively . . . low pressure

hydraulic control for faster, more responsive load handling. No wonder P&H can deliver more, every day of the week.

Ask your P&H Dealer — that's the first step toward lower costs.

P&H POWER CRANE AND SHOVEL DIVISION

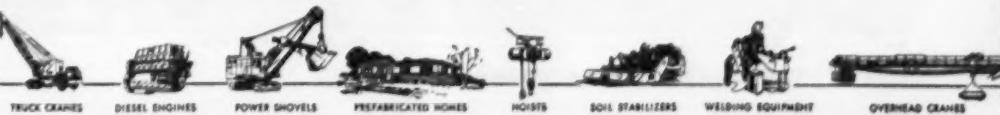
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"Your P&H Dealer has the experience, the organization and the facilities to serve you reliably in every way. He's ready to deliver the

kind of on-the-ground service that keeps your jobs moving on schedule. Your P&H Dealer is tops in the business. Get to know him."

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faster
safer

with MILLER Tilt-Top



MILLER Tandem Axle
10 ton Tilt-Top Model "BT-10"

In the picture above ONE man is loading a big, heavily equipped D-4 by simply driving it onto the tilted platform of the tandem axle Model "BT-10" MILLER Tilt-Top. The entire loading operation takes less than TWO minutes. Big and broad, the oak decked platform provides plenty of room and an extra low climb angle for maximum operator and equipment safety. For faster, safer between-job hauling of dozers, rollers, and other heavy equipment, get a MILLER Tilt-Top . . . you'll find it pays for itself!

✓ built best
✓ priced best

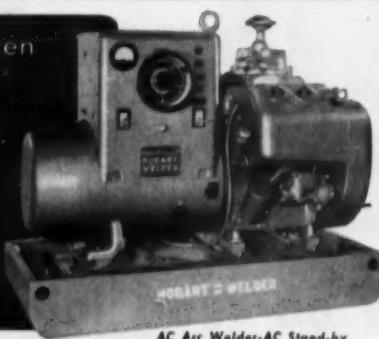
See your MILLER distributor or write for FREE literature to:

MILLER research engineers

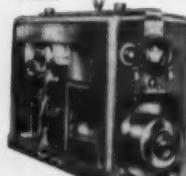
457 S. 92nd Street, Milwaukee 14, Wis.

Air-Cooled Engine Driven Combination Arc Welder and Power Plant

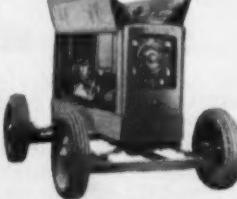
Power for tools, lights and arc welding ANYWHERE!



AC Arc Welder-AC Stand-by Power Unit. Power for tools, lights and arc welding anywhere.



"Contractor Special" Arc Welder.



Gas Drive DC Arc Welder.

HOBART TROY OHIO **WELDERS**



Tear off and MAIL TODAY!

• HOBART BROTHERS CO., Box 615, Troy, Ohio, U.S.A. Telephone 21223

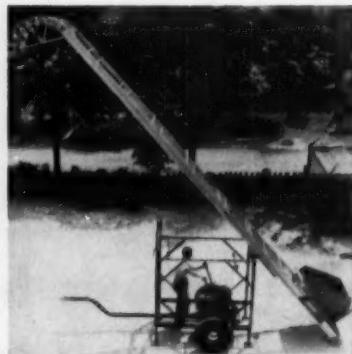
Without obligation, please send information on items checked.
 AC Arc Welder-AC Power Unit "Contractor Special"
 DC Gas Drive Welders Electrode samples for

NAME _____ POSITION _____

ADDRESS _____



TRENCHER BUCKETS—A newly designed pocket and tooth for trencher buckets has a pocket of one-piece drop-forged high carbon steel. The design provides a smooth radius in the pocket opening which permits a positive taper fit with the tooth, in addition to the quick change feature. The new rock point is drop-forged from steel. The serrated face of the point permits easier digging, plus the added features of minimum leverage and self-sharpening point.—Jetco, Inc., 1100 Westminster Ave., Alhambra, Calif.



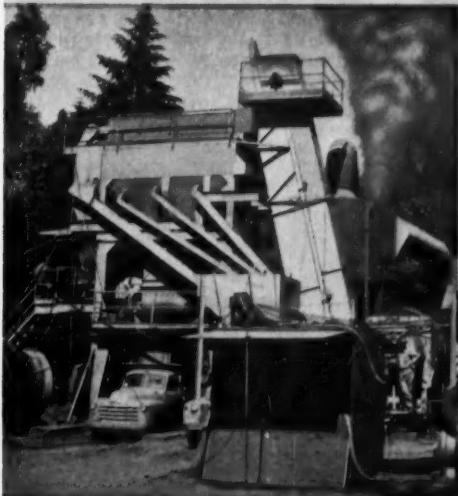
TOWING UNIT FOR HOIST—Owners of the Lad-E-Vator hoist can save additional time with the new Trail-Erector trailer unit just made available. The hoist mounted on the Trail-Erector can be put in position and ready to operate 10 min after it is on the job, according to the manufacturer. The tow car or truck is hitched to Trail-Erector, and the unit is pulled away from the wall. The hoist tower next is brought down to traveling position just enough off horizontal to give clearance for the top of the towing vehicle. The hoist brake then locks the tower into position, and the unit is ready to move. Weight of the entire unit is 249 lb.—Campbell Equipment Co., 2122 N. Menard Ave., Chicago 39, Ill.

TAKE ADVANTAGE OF

MADSEN's**"One-Stop" SERVICE**

★ You can save time and money when you come to MADSEN for all of your asphalt paving plant and asphalt paving plant equipment needs! From one of the West's most modern manufacturing plants MADSEN offers you a complete line of outstanding batch capacity asphalt plants and the most complete and finest stock of asphalt paving plant equipment and replacement parts. MADSEN asphalt plants are built in sizes from 1000-lbs. per batch to 6000-lbs. per batch. MADSEN replacement parts service is available to you on a 24-hour, 7-day-a-week basis... a service you can depend on when you need it. A continuing program of research and development and careful inspection and testing of each individual product for quality and workmanship... is your assurance that you are getting the best in every way when your product bears the name MADSEN.

MADSEN has been building asphalt paving plants and asphalt paving plant equipment since 1914 (the oldest manufacturer of asphalt paving plants in the West). Put this MADSEN experience to work for you... make your next asphalt plant a MADSEN, and when you need asphalt paving equipment of any type remember MADSEN's "One-Stop" SERVICE can save you time and money!



The plant shown above is the MADSEN Model 48T... engineered and built to provide the contractor with a portable asphalt plant having a faster charge-mix-discharge cycle, greater accessibility, easier maintenance and more desirable features than can be found in any other asphalt plant of its type.



MADSEN offers the most complete and finest replacement parts service available for all asphalt paving plant equipment. This service is available on a 24-hour, 7-day-a-week basis.



Equipment that Serves

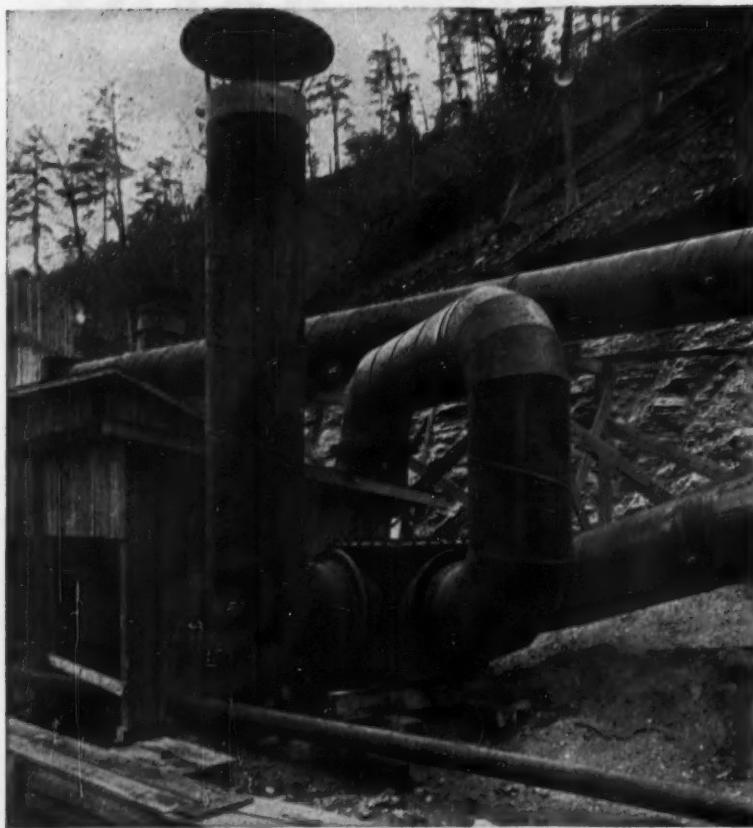
MADSEN products are sold by established dealers everywhere. Write for name of your nearest MADSEN dealer and for your copy of the MADSEN catalog.

The Industry's "One-Stop"
Headquarters for asphalt plants,
asphalt plant equipment,
parts and service

MADSEN IRON WORKS, INC.

14100 EAST ROSECRANS AVENUE • P. O. BOX 38 • LA MIRADA, CALIFORNIA

MAN-MADE WEATHER for UNDERGROUND SERVICE



There's nothing more vital in underground construction than a dependable method for supplying fresh air and eliminating stale air, gases, fumes and dusts. That's where Naylor light-weight pipe comes in, providing the most dependable system for push-pull ventilation. Its light weight makes it easy to handle and install, particularly with the Naylor one-piece Wedge-Lock coupling to speed connection. Extra collapse strength and safety are assured through Naylor's exclusive lock-seamed spiralwelded structure which permits the use of lighter gauge steel without sacrificing strength. For full details on this outstanding pipe and coupling combination, write for Bulletins No. 507 and No. 514.

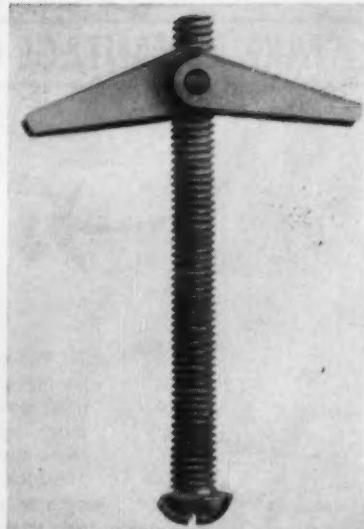


NAYLOR PIPE

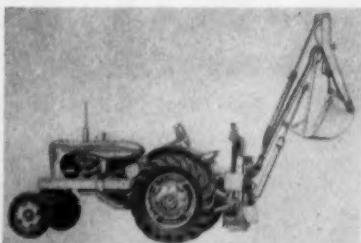
NAYLOR PIPE COMPANY

1268 East 92nd Street, Chicago 19, Illinois

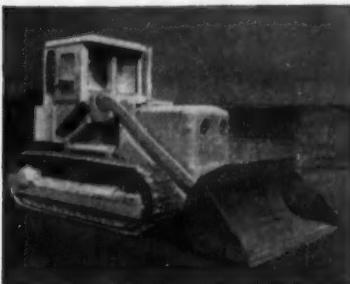
Eastern U. S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York



NEW TOGGLE BOLT—The Rawl toggle bolt is rust-proof and has a positive automatic spring action wing. It is ideal for anchoring to hollow walls, pressed wall board, tile, sheet metal, etc. Bolts are available with round or flat heads in five diameters from $\frac{1}{8}$ to $\frac{3}{8}$ in. and in lengths from 2 to 6 in.—The Rawlplug Co., 271 Church St., New York 13, N. Y.



A-C ADDS BACKHOE—The Allis-Chalmers Model WD-45 wheel tractor is now equipped with the Henry backhoe as well as backfilling blade, straight and angle dozers and front-end loader. The WD-45 is powered by the Allis-Chalmers Power-Crater gas engine which develops 45 hp. It weighs 4,000 lb. The basic unit contains the WD-45 tractor and the Henry backhoe. Attachments available to contractors and other users of the WD-45 include five buckets 16 to 24 in. wide, interchangeable with the backhoe for use in stockpiling, truck loading and other dirt-moving jobs. Maximum loading height with the rear-mounted unit is 9 ft. Front-mounted attachments include the 1/3-cu yd front-end loader for digging and loading; a backfill blade for light dozing and clearing, stockpiling, cleanup and general maintenance work. Also available is a lift fork, crane hook and straight and angle dozers.—Allis-Chalmers Mfg. Co., Tractor Div., Milwaukee, Wis.



CAB FOR NO. 6 SHOVEL—The Caterpillar No. 6 shovels are now being equipped with roomy reinforced cabs made of 12-gage steel reinforced by 3/16-in. steel framing. Simple installation and removal of the cab can be made without disconnecting any hydraulic lines or altering the tractor. Hinged rear window swings open for ventilation and the windshields are vertically mounted to minimize chances for glass breakage. The cab dimensions are 63 in. high, 52 in. wide, 45 in. long with a 25x33-in. door opening. Shipping weight is approximately 725 lb.—Crenlo, Inc., Rochester, Minn.



PORABLE ARC WELDER—Weighing only 65 lb and operating on either 110 or 220 v ac, 60 cycles with a rated output of 200 amp is this portable arc welder. It is said that this Bren-Weld arc welder does the work of a conventional welder four or five times its size. It will handle electrodes from 3/64 in. up to and including 5/32 in. using either metallic or carbon arc process. It is manufactured by Brennen, Bucci and Weber, Inc., and is available from Kasson Die & Motor Corp., 32-14 Northern Blvd, L. I. City, N. Y.



Malsbary Model 250 cleaned this D4 in less than 60 minutes. Note compact, hard-hitting stream and absence of work-hiding steam.

Put Pressure on Your Cleaning Costs with the New, Improved Malsbary Model 250

**20% Boost in Pressure and Volume,
Blasts off Grease, Tar, and Caked Dirt
Twice as Fast as Steam Vapor Cleaners**

Tough equipment cleaning jobs require lots of hot solution and real impact. There's plenty of both in the new Malsbary 250 HPC (high pressure combination) cleaner. Top pressure has been boosted 20% to 300 p.s.i., volume upped to 360 g.p.h. This pressure delivers cold water, hot solution (steam), or hot rinse with an explosive impact that blasts away stubborn asphalt or caked mud and grease other cleaners can't touch. In addition, you get wet steam and hot water for such jobs as cleaning and degassing tanks, thawing, or concrete mixing in zero weather.

Two-way Pay-off

The Malsbary 250 does any cleaning job twice as fast as a steam vapor cleaner; and does most jobs 4 to 10 times faster. Cleaning a D8, for example, takes 1½ to 2 hours with the

Model 250 compared with 8 hours for steam vapor cleaner. You save 6 hours labor, and gain 6 hours of tractor working time. Where you're operating or renting equipment fleets savings in equipment downtime alone on just a few cleaning jobs often more than repay the cost of a Model 250.

Why settle for a half-way cleaner when a Malsbary 250 can cut your cleaning costs in half? For proof, ask your Malsbary dealer to demonstrate on your job now...or write us today for the 8-page catalog describing the new, improved Model 250.



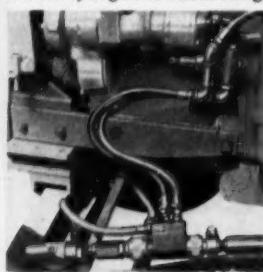
Room C1, 845 92nd Ave., Oakland 3, Calif.

NOW! A REAR-ENGINE LOADOR



POWERFLOW HYDRAULIC BOOSTER TAKES EFFORT OUT OF STEERING ... CONSERVES PUMP CAPACITY

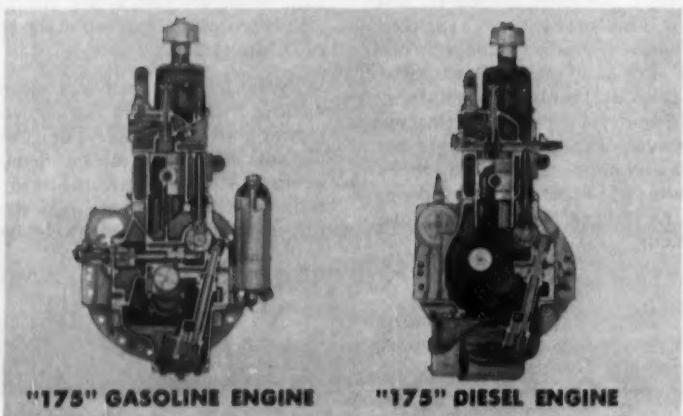
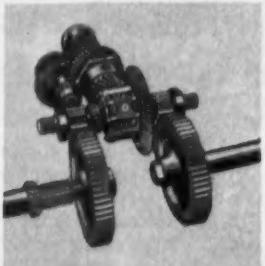
A built-in Powerflow hydraulic booster makes the MM "175" Loador easier to steer than ever before. The booster operates on low pressure . . . conserves pump capacity for high bucket lifting rate. Heavy fabricated loader arms are full cantilever units with parallel control arms that automatically regulate bucket angle to prevent spillage.



1½ YARD
BUCKET
CAPACITY

HEAVY-DUTY TRANSMISSION AND FINAL DRIVE DELIVER BIG WORK CAPACITY . . . LONGER

Power developed by the "175" is applied to the job through a heavy-duty transmission, differential and final drive housed in the main case. Bull gears are solid one-piece forgings. To assure full capacity, heavy cast axle housings are a part of transmission unit. Axles have 3½" diameter and are involute-splined and heat-treated for greatest strength.



"175" GASOLINE ENGINE

"175" DIESEL ENGINE

HIGH-TORQUE "175" ENGINES OFFER HEFTY RESERVE POWER AT LOWER PER HOUR COSTS

High-turbulence gasoline or "energy-cell" diesel engines of the MM "175" offer controlled combustion to deliver high torque at moderate engine speeds and reduced fuel consumption. The high-torque power reserve prevents "fading" or stalling out, assures heaped buckets in practically all conditions. Extra "beef" built into "175" engines means long, dependable operation at full-rated power. These engines have extra crankcase depth below the center-line of the crankshaft and a wide fly wheel housing flange coupled to the transmission case to give 360° effective rear main bearing support.

WITH COMPLETE UNIT DESIGN!



"175"

THE ORIGINAL MODERATE SPEED
HIGH-TORQUE ENGINE AND FULL
REVERSING TRANSMISSION COMBINATION.

It takes *unit design* to give you maximum capacity, lowest operating cost, and greatest durability in a rear engine loader. Only when all parts are matched and specially engineered by one manufacturer for one model can you expect rated performance over prolonged periods. Because rear engine loaders are completely enclosed for trim appearance, unit construction is often over-looked. That is why it is important to look deep down under the enclosures. Examination of the Minneapolis-Moline "175" engine-transmission final drive-rear axle unit shows how extreme rigidity is obtained by eliminating side frame members. Oil pump, governor, water pump are built in to make the engine compact . . . gear-driven for dependable heavy-duty operation . . . easily accessible for servicing.

Brakes are double-disc type and mounted on transmission countershaft. Reverse transmission is combined with regular transmission . . . gives 6 forward and 6 reverse speeds. Direction of travel is instantly changed without

shifting by working the "shuttle lever". All gear shafts are mounted on anti-friction bearings to take continuous full engine torque in any gear.

Traction and stability are an inherent part of MM "175" unit design with 18:00 x 26 front and 10:00 x 20 rear tires. The rear axle is clevis pivoted to obtain free travel and even keel on rough ground. Integral-cast rear bumper or push pads eliminate bolted-on counter weights or ballast boxes.

These are a few of the advantages that give unit design a big edge over stock assemblies when it comes to heavy-duty performance. Unit manufacture also cuts initial costs and service expense because it eliminates multiple sources of supply.

It will pay you to know all the ways the unit-designed MM "175" can earn and save you money. See your nearest MM Distributor or write for complete information.



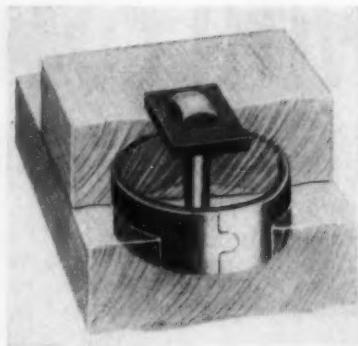
MINNEAPOLIS-MOLINE
INDUSTRIAL DIVISION • MINNEAPOLIS 1, MINNESOTA



WIDE SCHIELD BANTAM—The new wide-base version of the Schield Bantam $\frac{3}{4}$ -cu yd crawler-mounted crane excavator has, according to the company, the following advantages over former methods of operation: it will straddle ditches working directly over the ditch areas instead of alongside; removes ground-bearing pressure from ditch walls, preventing crumbling and cave-ins; converts quickly to standard width for normal crawler operations; provides high flotation and dumps freely to either side. Extensions are available in 21- and 46-in. widths to meet varying work re-

quirements from area to area, and pin on to the basic crawler frame providing over-all widths up to 16 ft 10 in. Installation of the wide-base extensions can be handled in about 4 hr with two workmen.—**Schield Bantam Co., Waverly, Iowa.**

DREDGE AGITATOR — A suction dredge agitator designed to increase dredging output and reduce downtime because of clogging of the nozzle is known as the Agipeller. The new device is a simple, powerful oscillating agitator activated by hydraulic power from the deck of the



dredge. It is claimed it eliminates the heavy weights, long shafting, bearings, couplings, chains and pins associated with conventional-type ladders. The hydraulic pump of the power unit may be either direct-connected to a motor or run off a jack by V-belt drive.—**W. H. Pfarrer Co., Chicago, Ill.**

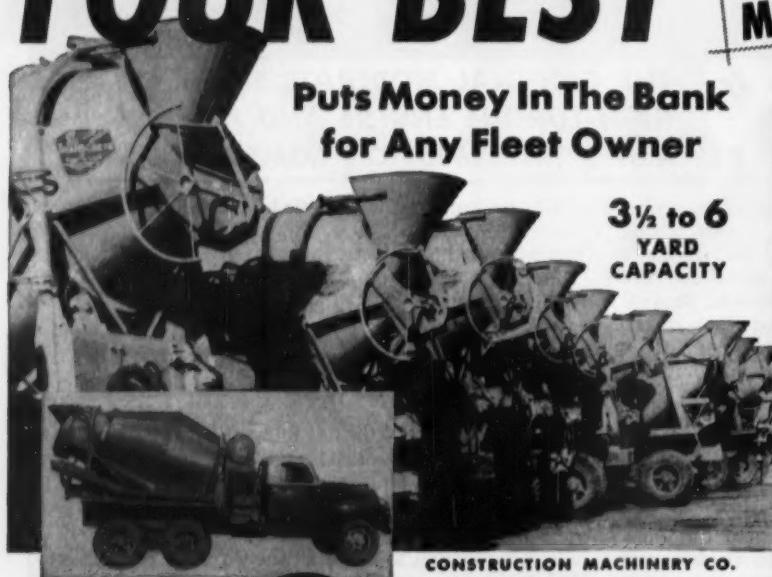
TIMBER RINGS—This Cleveland timber ring makes stronger timber joints quickly and easily. It permits the use of light trusses in small construction. Spans up to 30 ft are made with 2x6 rafters with 2x4 ceiling joists across the bottom. Ring is set into the timbers in grooves by the Cleveland grooving tool so that half the ring is embedded in each timber at the point of contact. The joint is completed with bolt and washer. The rings are split with tongue-and-groove joints, insuring tight contact with the wood. This reduces joint slippage and reduces stresses in the wood, permitting the use of smaller timbers to gain equal strength.—**Cleveland Steel Specialty Co., Inc., Cleveland, Ohio.**

YOUR BEST BUY

TRUCK
MIXER

Puts Money In The Bank
for Any Fleet Owner

3½ to 6
YARD
CAPACITY

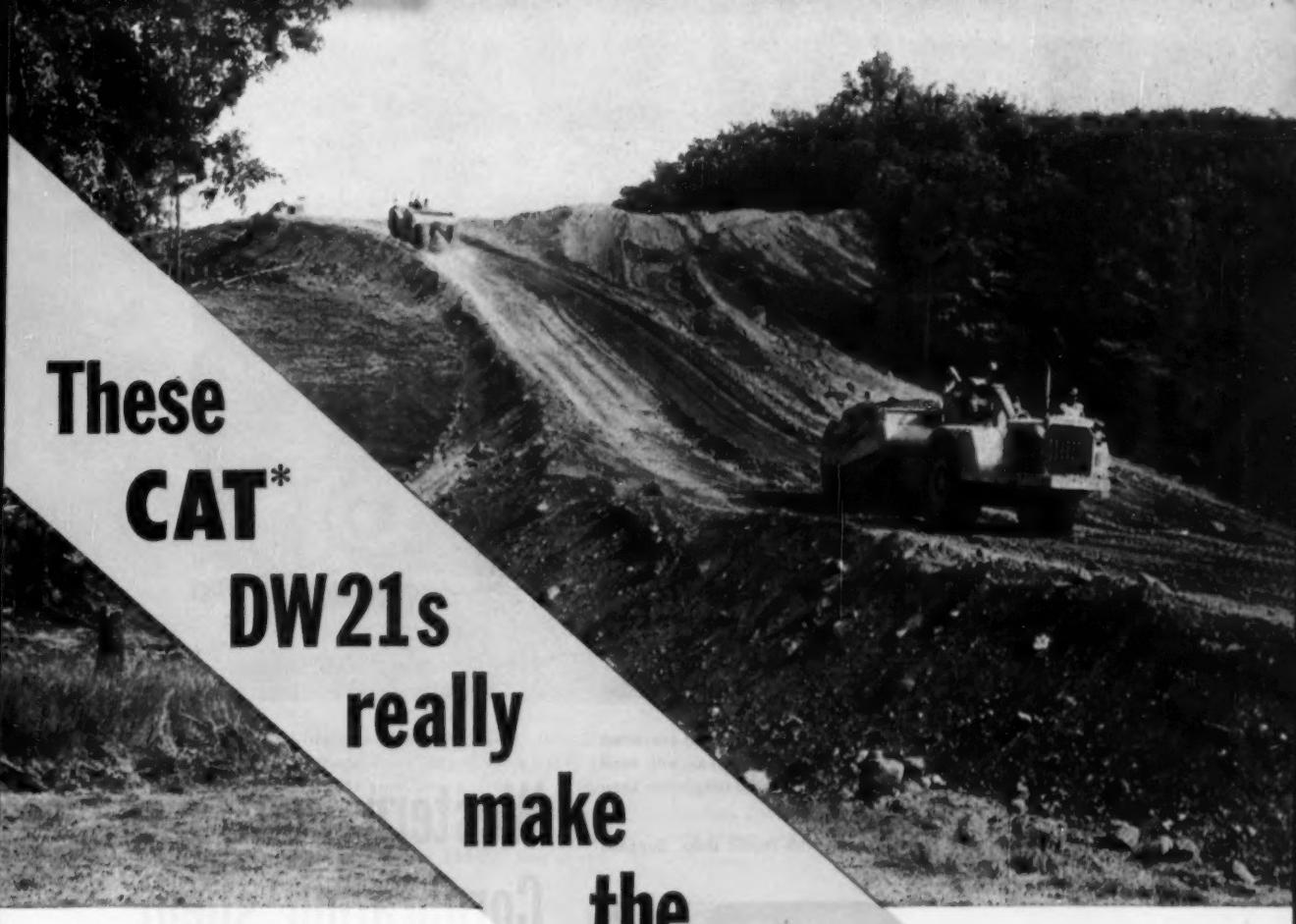


CONSTRUCTION MACHINERY CO.
Waterloo, Iowa

Again Improved for
More Payload on
the Road . . . More
Concrete in the Forms

- EASIER, SIMPLER to handle on the road — on the job.
- THORO-MIX ACTION. Mixes, discharges all slumps.
- SIMPLEST DESIGN OF ALL. No maintenance or service problems.
- LIGHTER IN WEIGHT — yet more rugged! Outlasts them all.

→  **TRANSCRETE**®



These **CAT*** DW21s really make the grade

THAT'S a 28% grade these Caterpillar DW21 Tractors with No. 21 Scrapers are working.

They're starting an 85-foot cut through sandy clay and boulders. The DW21s load on the level, haul downhill, then scoot back up that slope for more.

"A steep grade like this is certainly a tough tryout for any rubber-tired machine," says Oscar Lindstrom, superintendent for Victor Nelson Construction Company, "but those DW21s take it in stride. They're about the best earthmovers you'll find on rubber."

Here, southwest of Slinger, Wisc., constructing a new grade and right-of-way for U.S.-Wisconsin No. 41, each of four Cat DW21 Tractors is moving 250 yards an hour—830,000 yards in all. "They handle a great deal of payload in a day," says Superintendent Lindstrom.

Other users say much the same. One reason: the DW21 is the only two-wheel earthmover designed and built by one company—every part matched to deliver peak performance on the job.

Another: its 225 HP is all there at the flywheel. As Mr. Lindstrom points out, here's one rig that won't smother on grades.

And a third reason: always handy with prompt, genuine parts service is your Caterpillar Dealer. He'll be glad to demonstrate this high-speed, high-capacity, big yellow machine any time you say.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.



CATERPILLAR®

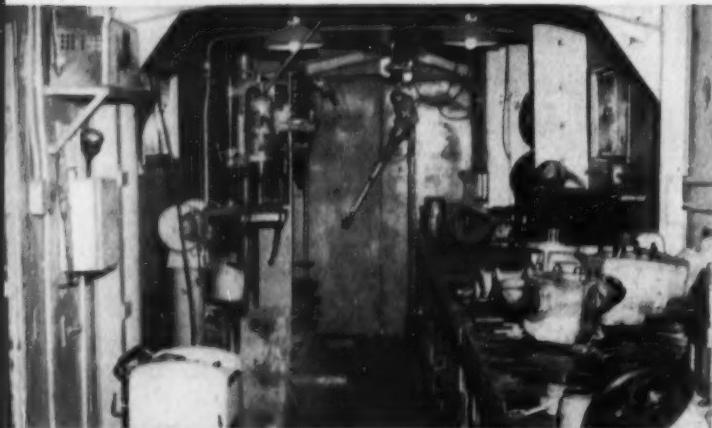
*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE

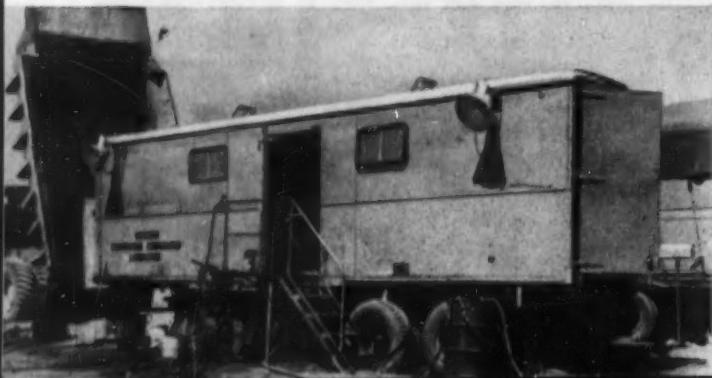


WESTERN'S ON-THE-JOB MAINTENANCE is centered around converted semi-trailers. Interior view shows a well-equipped repair van with tools and facilities for all but the largest jobs. 35 mobile radio-telephones keep the maintenance and field crews in constant contact.

LUBE VAN (below) operates in conjunction with repair shop. Supplies power for the shop with 30-kw generator.



PROPER MAINTENANCE HAS PAID OFF in reduced downtime and increased capacity for Western's \$10-million worth of equipment. Above is a typical job-site grease rack on Ohio Turnpike for maintenance of this outfit's highway-type trucks. At left can be seen a lube van for storage of extra drums.



Western Contracting Corporation spent \$2,235,000 on operation and maintenance of equipment

With over 200 units of major construction equipment, ranging from shovels, trucks and tractors to dredges, aircraft and railroad cars, Western Contracting Corporation of Sioux City, Iowa, completed \$18-million worth of work in 1953.

Western is now engaged in many heavy construction jobs including: strips of the Ohio Turnpike and Indiana Toll Road; Gavins Point Dam in South Dakota and Forbes Air Force Base in Kansas. Realizing the importance of dependable equipment on these important jobs, maintenance plays a big part in Western's operations. All maintenance and repair work is performed by their own personnel. A stock of repair parts is kept on each project — these parts inventories vary with the amount of equipment operating on the particular job.



AERIAL VIEW OF FORT RANDALL DAM SPILLWAY. With efficiently operating machinery, Western was able to move 1½ to 1¾ million yds of earth per month. The units were overhauled at least once every 500 hours, being completely steam cleaned, repaired and painted before going back into the field. On jobs of this type, Western used 686,000 bbls. of cement and 725,000 tons of con-

crete aggregate and spent over \$3½-million last year for permanent materials installed in work. When buying materials and supplies, contractors specify or influence buying of one brand over another. Consistent advertising in METHODS will make your products known and recognized by over 35,000 paid subscribers.

Some of the automotive equipment which Western Contracting owns and maintains includes:

Over-the-road trucks	Off-the-highway trucks
60 end-dumps	30 52-ton end-dumps
26 pickups	11 30-ton end-dumps
22 platform trucks	25 40-ton bottom dumps
4 passenger cars	9 20-ton bottom dumps
3 truck-tractors	22 3000-6000 gal. waterhauling units
2 concrete trucks	

Operating maintenance and repair work is done in shops at job sites, while all heavy repairs are done at the main shops in Kansas City. Among 415 major shop items, Western owns and operates:

- 2 portable shops
- 1 portable machine shop
- 1 engine rebuild shop
- 18 portable grease outfits
- 27 electric welders - 330 amp
- 9 steam cleaners
- 10 portable diesel generators (30 to 1,000-kw)
- 14 substations (2 portable)

Western Contracting is one of 7,664 contractors who did \$100,000 or more in business last year.

Western Contracting is one of 2,184 contractors who received contracts worth more than \$1-million in 1953. In addition, 5,480 other contractors were awarded contracts worth over \$100,000 last year. The people who successfully sell these contractors keep in constant touch with the buying influences at all levels. Each month, over 35,000 construction buying influences pay to read METHODS. They read METHODS thoroughly, as proved each month by Readex Reader Interest Reports.

Call your METHODS man today — he'll be glad to give you more facts on your major construction customers — who they are, where they are, what they do and how to reach them.



SHOP WORKER SPRAYS PAINT on body of heavy truck — final step in Western Contracting Corporation's equipment overhaul process. Surveys indicate contractors are large buyers of paint and sprayer equipment.

CONSTRUCTION METHODS AND EQUIPMENT

ABP A McGRAW-HILL PUBLICATION
330 WEST 42nd STREET, NEW YORK 36, N.Y. ABC



VIBER VIBRATOR selected for concrete compaction in crucial area to produce maximum density at the point where concrete stress is critical.

Vibration essential in crucial area around prestressing cones

THE RICHFIELD OIL BUILDING ANNEX in Los Angeles is the largest monolithic prestressed concrete office building in the United States today. According to Albert C. Martin and Associates, architects and engineers on this project, prestressed construction was adopted because of design problems resulting from the matching of 10 foot 3 inch floor to floor heights in the existing building. With 8 feet the minimum clearance height, prestressing not only made possible the matching of the high velocity air conditioning ducts, and at the same time installation of recessed lighting, but

allowed a 46 foot clear span for flexibility in partitioning of office space. Because of the lack of room for erection equipment the new structure was cast in place.

• Concentration of load on the cable anchorage by stressed cables makes the area around the cones the most crucial area. Because patching of concrete in this area of cast-in-place prestressed concrete could scarcely be tolerated, consolidation of the concrete in this area is particularly important.

• Guy F. Atkinson Company, contractor, used Viber 1-5/16 and 1-3/4 inch diameter vibrators. Model E electric motor driven vibrator 1-3/4 inch diameter was used at the base of cone, or where spacing would allow, the 1-5/16 inch diameter Model 26 was used between cones as well as at the base of cone.

For further information on Viber's complete line of internal and external vibrators, contact your authorized distributor or Viber Company, Dept. 75, 726 South Flower Street, Burbank, California.



THE CONGESTION of prestressing cables and cones at the point of maximum load requires top performance from vibration equipment.



CONCRETE VIBRATORS SINCE 1931

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

SCRAPER HOIST CATALOG—A full line of air and electric hoists for handling bulk materials of all types is described in a 44-p catalog just released. Features of each type and size are given, along with specifications, capacities, sizes, symbols and accessories available. Tables covering weights of materials and rope pull required for drawing cars up grades or inclined tracks are included in the information. For your copy of this well-illustrated and well-written catalog send your request for Form 5300-A to **Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.**

HOIST CATALOG—A 16-p brochure, Form P-495-A, contains a number of illustrations, cutaway photographs, charts and diagrams which should be valuable information for anyone contemplating the purchase of electric hoisting equipment. You can get a copy of this booklet by making your request to **The Yale & Towne Mfg. Co., Philadelphia 15, Pa.**

TECO DESIGN SERVICES—Various timber design services available, without charge, to architects and engineers who contemplate structures of wood are covered in a new publication called "This is Teco," just released by Timber Engineering Co., research affiliate of National Lumber Mfrs. Assn. This booklet gives a panoramic view of the activities of this organization and its promotion of the use of wood as an engineering material in light and heavy construction. The booklet, available without charge, can be obtained from **Timber Engineering Co., 1319 - 18th St., N. W., Washington 6, D. C.**

STRADDLE CARRIERS—If you are interested in straddle carriers for possible application in your field a new booklet called The One-Truck Fleet is available without charge from the **Clark Equipment Co.**, manufacturer of the Ross Carrier, Benton Harbor, Mich.

LIFETIME STEEL FORMS—Catalogs showing form panels, accessories, tools and supplies and illustrating the use of Efco Lifetime steel forms, Economy steel rental forms or special forms built to your specifications are available upon request from **Economy Forms Corp., P. O. Box 128 H. P. Sta., Des Moines, Iowa.**

For Virginia's main truck route...

Laying the 1½ inch Texaco Sand Asphalt wearing surface over 5½ inch base of same type during construction of new traffic lane for US-301 in Virginia.



...this 7-inch Texaco Sand Asphalt Pavement



No longer adequate for today's traffic, this existing section of US-301 will serve one-way traffic when new Texaco-paved lane is completed.

Contractor
ADAMS CONSTRUCTION COMPANY
Roanoke, Va.

Most of the heavy truck traffic moving north and south through Virginia uses U.S. Route 301. To cope with its ever-increasing volume of traffic, the State gradually is converting US-301 into a dual highway.

The accompanying photographs show the construction of a new lane which parallels the existing route south of Petersburg. Plant-mixed Texaco Sand Asphalt was used for both base and wearing surface in this project. The base, 5½ inches thick, was constructed in three courses, on which the surface was laid to a thickness of 1½ inches. An 8-inch sand-clay sub-base supports the Texaco Sand Asphalt pavement.

Virginia put the emphasis on flexibility in constructing this new section of US-301. Flexible, resilient, shock-absorbing highways like this one are the most effective answer to today's heavy traffic. They withstand impact longer, hold maintenance costs down to a minimum and have a lower first cost than other highways with the same load-carrying capacity.

Helpful information about Sand Asphalt, as well as other road and street types constructed with Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils, is available in two booklets, which can be secured without obligation by writing our nearest office.

THE TEXAS COMPANY, Asphalt Sales Div., 135 E. 42nd Street, New York City 17
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TEXACO ASPHALT

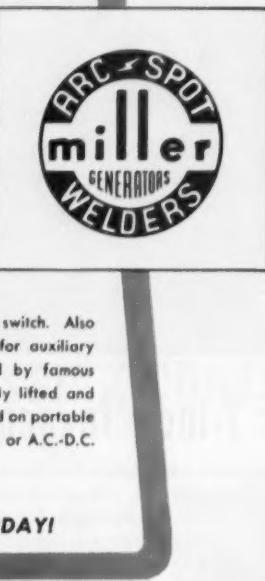


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Designed to furnish all welding and power requirements under field conditions, or where local electric power supplies are inadequate or erratic. Delivers 200 amperes of A.C. welding current or 4500 watts of A.C. power; changeover made by a convenient double-throw switch. Also provides 1000 watts of D.C. power (110 volts) for auxiliary universal tools or lights while welding. Powered by famous Onan Model CK 2-cylinder, 4-cycle engine. Easily lifted and carried—weighs only 435 lbs.—or may be mounted on portable running gear or road towing trailer. Handles A.C. or A.C.-D.C. electrodes from $\frac{1}{16}$ " to $\frac{3}{16}$ " inclusive.

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VIBRATING CONVEYORS — Now ready for distribution is a new booklet describing the Hewitt-Robins line of vibrating conveyors, well illustrated with pictures of typical installations handling material such as red hot steel, castings, scrap metal, sand, etc. Also covers technical details of both the Rockermount and Springmount type conveyors. Ask for Booklet No. 135-A from—**Hewitt-Robins, Inc., Stamford, Conn.**

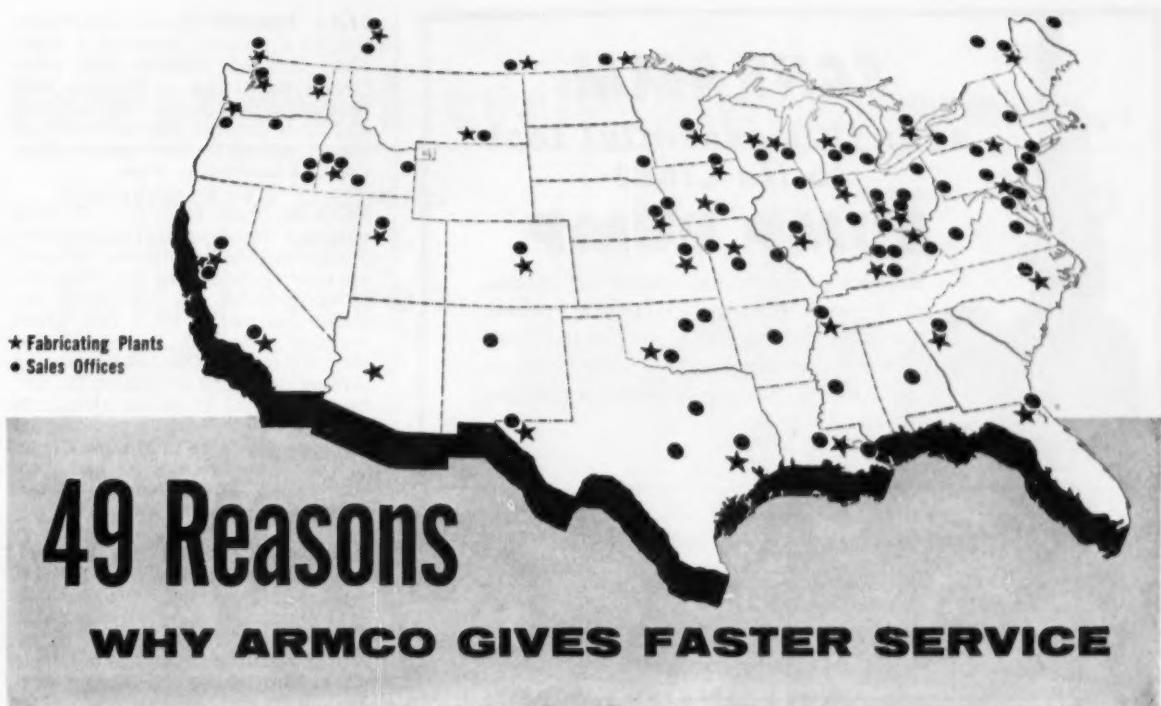
NEW TRANSPORT BODY—A 6-p bulletin describing the large volume Bulkmobile transport body describes its construction features, such as the all-hydraulic operation of the body conveyor, the all-welded, streamlined body, the compartmented interior for multiple deliveries, the externally controlled compartmented doors, roomy body hatches, etc. This unit, designed for the big jobs, can save contractors up to 75% on handling time, according to the manufacturer. Ask for Bulletin A-399.—**Baughman Mfg. Co., Jerseyville, Ill.**

A GOOD RECONDITIONING JOB—Using genuine parts is the subject of a new two-color booklet just put out by Caterpillar Tractor Co., entitled "A Good Reconditioning Job" which describes how Cat parts are better, how they reflect important late design improvements, designed to give extra long service, and other features. Ask for Form D419 from any Caterpillar dealer or from **Caterpillar Tractor Co., Peoria, Ill.**

DUMP BODIES—A 4-p 2-color catalog describing Galion Allsteel Model 12N-5 bodies and Model 800T, 880 and 77353 hydraulic hoists is available from any Galion distributor or from **The Galion Allsteel Body Co., Galion, Ohio.**

Join the
MARCH OF DIMES
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January

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22	23	24	25	26	27	28
29	30	31				



49 Reasons

WHY ARMCO GIVES FASTER SERVICE

Wherever your next job is located, it will probably be only a short distance from one of the 49 plants of Armco Drainage & Metal Products, Inc. This means you can get fast delivery on the Armco Drainage and Construction Products you need. Schedules are easier to maintain; transportation and handling costs are minimized. You can

always count on the same high-stand ard Armco service in every respect.

In addition, there are almost 90 conveniently-located Armco sales offices over the country. Here you will find qualified sales engineers ready to contribute Armco's wealth of experience to help with your drainage and construction problems.

Experienced contractors prefer Armco Corrugated Metal Drainage Structures because they are easily installed without heavy equipment; no special skills are needed for assembly; installed costs are usually lower than for other drainage material. And work goes fast in any season. See chart for designs and sizes.

PRODUCT		SIZES	PRODUCT		SIZES
STANDARD CORRUGATED METAL PIPE		Diameter 8" to 96"	MULTI-PLATE PIPE		Diameter 60" to 180"
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ASBESTOS-BONDED		Includes standard Pipe and Pipe-Arch sizes	MULTI-PLATE ARCH		Span 5' to 30'
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Other Armco products include Liner Plates, Steel Sheet ing, Pipe Piling and Pile Shells, Retaining Walls, Guard rail, Bridge Plank, Water Control

Gates and a complete line of Steel Buildings. For more data on any product, write us. Armco Drainage & Metal Products, Inc., 3605 Curtis Street,

Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

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SUMP PUMP

The Schramm pneumatic sump pump will remove 370 gpm of water (at 10 feet head) from excavations, flooded cellars, etc., so that work can be quickly resumed. Now ready for immediate delivery. Use coupon below for complete specifications and prices.



ROCK DRILL



PAVING BREAKER



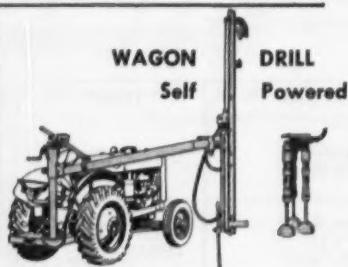
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SCHRAMM, INC.

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Schramm, Inc.

West Chester, Pa.

Please send me Bulletin SP-55 on Schramm's new Sump Pump.

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

CLAY PRODUCTS—A comprehensive 62-p. catalog covering a complete line of vitrified clay pipe, fittings, flue lining, wall coping, septic tanks, liner plates, chimney tops and other kindred clay products has been prepared by the **Superior Clay Corp.**, Uhrichsville, Ohio.

EUCLID—Two new 8-p. catalogs covering the Euclid 17-yd bottom-dumps and the twin-power scrapers are now available. The 17-yd bottom-dump, Catalog No. 251, gives detailed information on a unit which features excellent horsepower to weight ratio. The twin-powered scraper described in Catalog No. 551, hauls loads of 18 cu yd struck, 21 cu yd 3:1 slope, and 24 cu yd at 1:1 slope, at speeds up to 31 mph. Copies of this literature can be had from the **Euclid Div., General Motors Corp.**, Cleveland 17, Ohio.

AIR CONTROLS—A 12-p. illustrated brochure describing the air control system on the Michigan line of excavator-cranes, together with eight case history shorts can be obtained from the **Clark Equipment Co.'s Construction Machinery Div.**, Benton Harbor, Mich.

TRUCK CRANE—The 10-ton crane capacity P&H model 105 TC is described in complete detail in a new bulletin just released by Harnischfeger. The Model 105 TC is available only on its own precision-built carrier, and is converted to all other services handling standard buckets at efficient boom lengths. You can obtain a copy of this descriptive bulletin (TX-159) by writing **Harnischfeger Corp.**, 4610 W. National Ave., Milwaukee 46, Wis.

LOW-BED WATER TRUCK—A new low-bed water truck capable of carrying extra large bulk loads known as the Model FT-50 flat-top is now offered as a companion unit for Davey rotary air drills and mud drills. The truck employs a large capacity, flat water tank, the top of which serves as the bed of the truck. Tank is constructed of heavy-gage steel with the floor section covered with safety plate. The tanks are available in 650-800 and 1,000-gal capacities. For descriptive material on the truck request Bulletin E-260 from the **Davey Compressor Co.**, Kent, Ohio.

HARD-FACING ALLOYS—A single engineering data sheet describing special properties of Colmonoy hard-facing alloys is now available from **Wall Colmonoy Corp.**, 19345 John R St., Detroit 3, Mich.

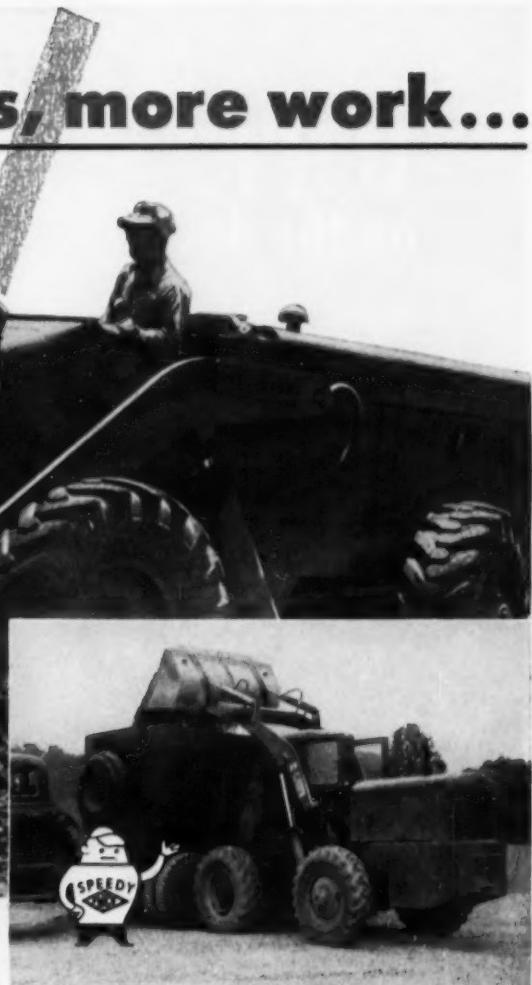
AIR-GRIP CLUTCH—A compact 4-p bulletin containing information on the newly developed Dodge air-grip clutch is available on request from Dodge distributors or from the **Dodge Mfg. Corp.**, Mishawaka, Ind.

Faster work cycles, more work...

**Contractors demand equipment with a
Fuller torque converter coupling**



Two workhorses in construction equipped with Fuller Torque Converter Couplings: Hough Model HM PAYLOADER (above), Pettibone Mulliken SPEEDALL, Front End Loader (right).



The performance of Fuller Torque Converter Couplings has been instrumental in helping contractors win the battle of competition, meeting contract deadlines, and offsetting rising costs of operation.

Here's *why* contractors demand Fuller Torque Converter Couplings. Torque demand is matched to the

load through 2.1:1 torque multiplication, and the converter automatically returns to smooth, economical fluid coupling operation as load demand drops. Operators can crowd the load at all times without engine luging or stalling . . . getting faster work cycles, more production every shift. The fluid cushions out shock

loads . . . saves engines, transmissions, drive lines, axles, brakes and tires . . . reduces maintenance expense.

If you are looking for equipment that offers *profit-plus performance* . . . look for equipment with a Fuller Torque Converter Coupling installed as the power transmission component. Write for descriptive folder.

The following equipment manufacturers offer Fuller Torque Converter Couplings in their equipment.

The Frank G. Hough Co.
PAYLOADERS

Contractors Machinery Co., Inc.
TROJAN LOADSTERS

Austin-Western Company
SELF-PROPELLED CRANE

The Buda Co.
TRACTORS & SHOP MULES

Jueger Machine Co.
LOAD-PLUS LOADERS

The Gerlinger Carrier Co.
FORK LIFT TRUCKS

Pettibone Mulliken Corp.
SPEEDALL & SPEEDSWING LOADERS

Plymouth Locomotive Div. F-R-H
INDUSTRIAL LOCOMOTIVES

Unit Crane & Shovel Co.
TRUCK CRANES

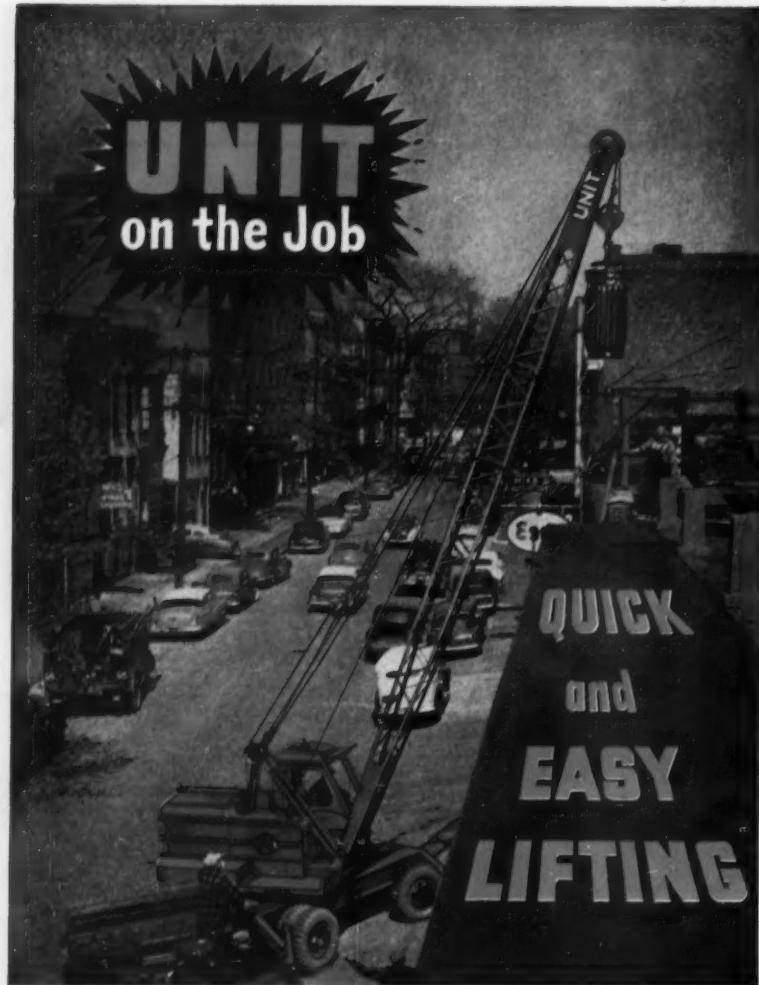
Transo Div., LeRoi Co.
TLF LOADERS

where torque ^{really} goes to work



FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wisc. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Western Dist. Branch (Sales & Service, All Products), 641 E. 10th St., Oakland 6, Cal.



UNIT on the Job

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EASY
LIFTING

For SM-O-O-THER OPERATION you'll prefer UNIT 357 Mobile Crane equipped with TORQUE DRIVE. It's a machine that travels anywhere . . . works efficiently where space is limited. Controlled and operated by ONE man. Powered by ONE engine. Provides full-circle, fast-cycle operation. Easy hydraulic steering from within the FULL-VISION CAB. Promotes safety. For HIGH PRODUCTION and LOW MAINTENANCE get the facts regarding UNIT 357.

Write for Bulletin No. L-302.

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1/2 or 3/4 YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS... GASOLINE OR DIESEL



All Models Convertible to All Attachments!

BIG JOBS OF THE MONTH . . .

Continued from page 26

Merritt-Chapman & Scott Corp., 260 Madison Ave., New York 16, N. Y. and **Savin Construction Corp.**, East Hartford, Conn. Construction of High Gorge power dam on the Skagit River, Washington, for the city of Seattle, \$14,731,107.

Gull Contracting Co., 35-15 Lawrence St., Flushing, N. Y. Constructing approach to the roadway system in Manhattan for Lincoln Tunnel, New York, for The Port of New York Authority, 111 8th Ave., New York 11. \$18,177,180.

Paulex Inc., First National Bank Bldg., Baltimore, Md. 11- to 16-story office building, Baltimore, Md. for Commercial Credit Co., St. Paul & Saratoga Sts., Baltimore. \$5,585,000.

H. B. Zachry Construction Division, Box 2570, San Antonio, Tex. Parkway apron and taxiway including 362,000 sq. yd. 15- and 16-in. concrete pavement at Abilene Air Force Base for U. S. Engineers, 100 W. Vickery St., Fort Worth, Tex. \$2,111,920.

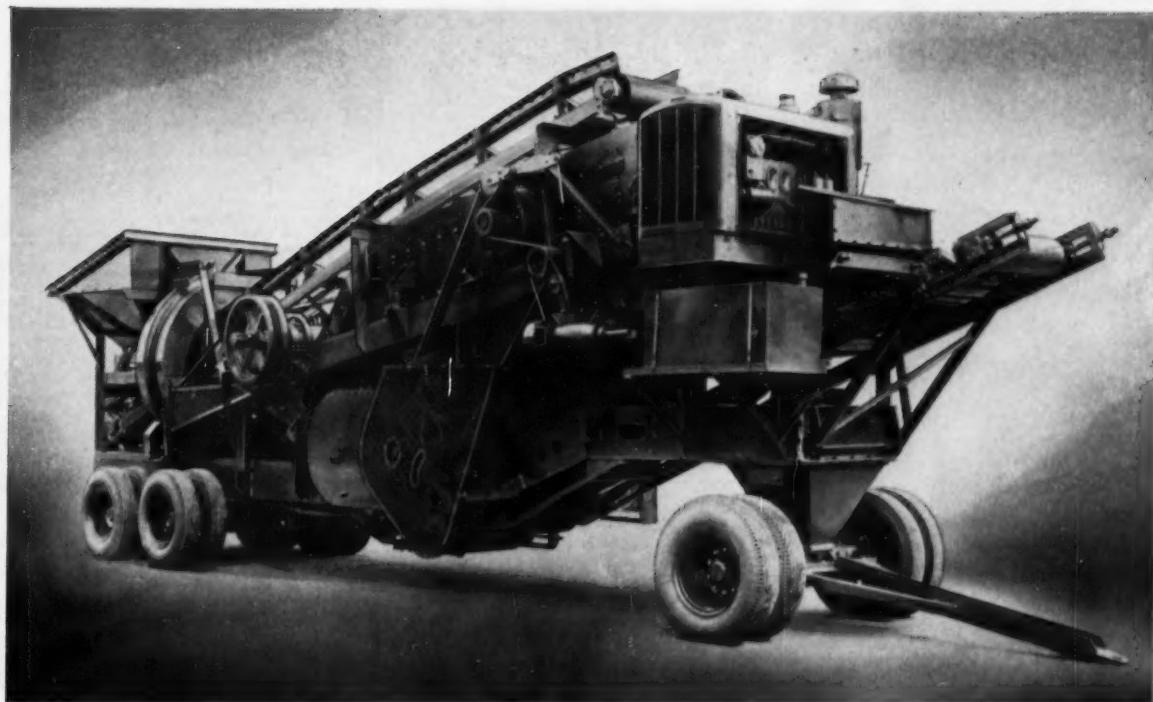
Missouri Valley Constructors, Inc., Box 801, Leavenworth, Kan. Powerplant addition at Great Bend, Kan. for Western Light & Telephone Co., 1015 Forest Ave., Great Bend, Kan. \$3,000,000.

A. Siegler & Sons, 5117 Lee Road, Maple Heights, Ohio. Design and construct 4-story store in Southgate Shopping Center, Maple Heights, Ohio, for Sears-Roebuck & Co., 8501 Carnegie Ave., Cleveland 6, Ohio. \$4,000,000.

Booth & Flinn, 1942 Forbes St., Pittsburgh, Pa. General contract for 120,000-kw steam electric generating plant at Philo, Ohio for Ohio Power Co., 301 Cleveland Ave., Canton, Ohio. \$12,000,000.

Cook Construction Co., Box 1151, Jackson, Miss. Lovewell Dam, Bostwick Division, Missouri River Basin Project near Mankato, Kan. for Bureau of Reclamation, Superior, Neb. \$2,324,850.

Sollitt Construction Co., 301 South Columbia St., South Bend, Ind. 225,000-kw steam-electric generating unit, Glen Lyn, Va. for the Appalachian Electric Power Co., 40 Franklin Road, Roanoke, Va. \$26,400,000.



Why this new ultra-modern in-line plant was developed

● Here it is . . . a gravel plant with a 1036 jaw crusher, 30" x 24" rolls, and a big 4'x12'-2½ deck vibrating screen, — yet which weighs only 55,900 lbs. on the road . . . a plant equipped with the most efficient mechanical drives ever devised for a portable plant . . . a plant which can be moved without dismantling!

In the past, highway load limits have been met in one of two ways . . . either by reducing the size of crushers, screens, and other units in order to save weight . . . or by dividing the plant into individually mounted primary and secondary plants.

In one case, capacity was sacrificed. In the other, portability was lost, cost was higher, and longer set-up time was needed at the pit.

Specially designed crushers, screens

To create the new 35-S, PIONEER engineers began by redesigning its basic units. They developed a new angle of tilt for the jaw crusher to improve feeding of oversize and make adjustment easier. The 1036 crusher, incidentally, is the largest used in

any portable duplex gravel plant.

The specially designed 30" x 24" roll crusher is hydraulically adjusted and gives $\frac{1}{3}$ more crushing area. A new-type 4'x12'-2½ deck vibrating screen and 30" conveyors, are as large as you'll find on any plant of comparable weight and cost.

Efficient drive is developed

V-belts and a minimum of high-speed steel roller chains drive the entire plant, except for one fully enclosed right-angle drive.

For quick moves, it's seldom necessary to dismantle feeder hopper, feeder, sand conveyor, or power unit. Just pull into a new pit, start the power, and go to work!

The 35-S is designed for long life with a minimum of down-time. On the rare occasions when maintenance is necessary, parts are easy-to-reach and easy-to-repair.

If you're considering a project in which extra portability and low cost production will prove an advantage, it will pay you to investigate this revolutionary new plant. You'll be surprised at its low cost, as well as the competitive advantages it will give you.

For more details, write to Pioneer Engineering Works, Inc., Minneapolis 13, Minnesota (subsidiary of Poor & Company, Chicago).

MOVING WEIGHT AND POWER

Total weight	55,900 lbs.*
Weight front end	22,800 lbs.*
Weight rear end	33,100 lbs.
Power required	130-150 HP continuous at 900 RPM output shaft speed for on-plant, 900-1200 RPM output shaft speed for off-plant.

*Weight with semi-hitch. For single axle dolly, add 2200 lbs.

Pioneer

Contangle EQUIPMENT

Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.

Please send information on equipment checked.

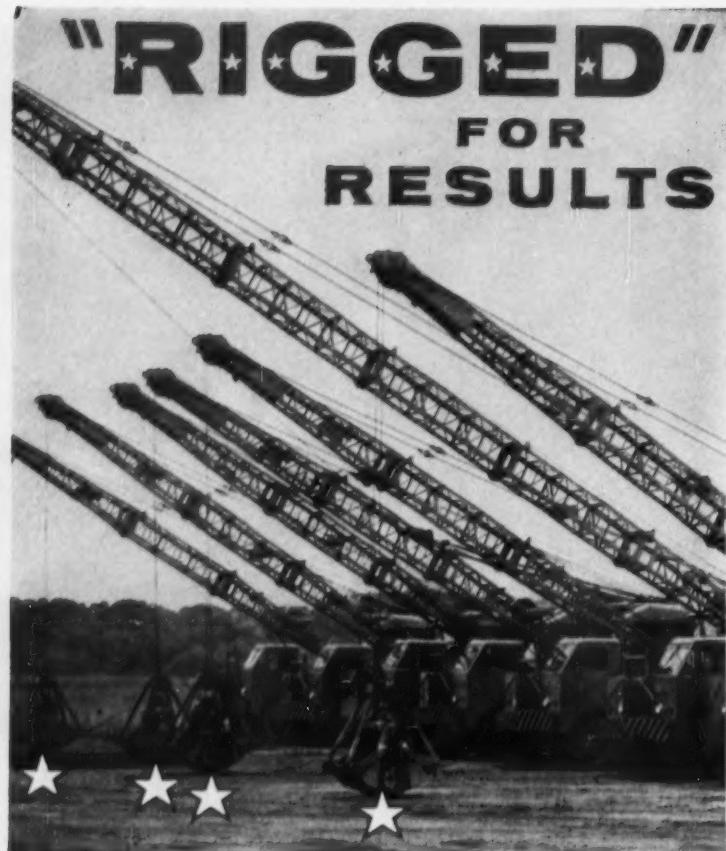
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| <input type="checkbox"/> ROCK PLANTS | <input type="checkbox"/> BITUMINOUS PLANTS | <input type="checkbox"/> VIBRATING SCREENS |
| <input type="checkbox"/> JAW CRUSHERS | <input type="checkbox"/> APRON FEEDERS | <input type="checkbox"/> BUZZER SCREENS (LIGHT DUTY) |
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Name _____

Company _____

Address _____

City _____ Zone _____ State _____



This impressive fleet of Byers Truck Cranes is lined up to start a Walsh-Perini-Groves-Slattery Co. construction job for the United States Steel Fairless Plant at Morrisville, Penna.

Four of these cranes are "Rigged for Results" for faster, more efficient excavating by being equipped with

OWEN Buckets

Owen wins the approval of leading contractors because of their superiority in handling all excavating, trenching, dredging and rock handling operations.

Owen material handling buckets are just as popular because they are specially designed to meet the wide variety of operations encountered in this field.

Send for free illustrated catalog today.



THE OWEN BUCKET CO.

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Branches: New York, Philadelphia, Chicago, Berkeley, Calif.—Fort Lauderdale, Fla.

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Number of copies of this issue printed 40,287

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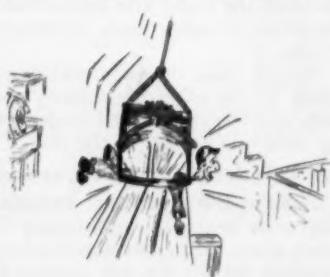
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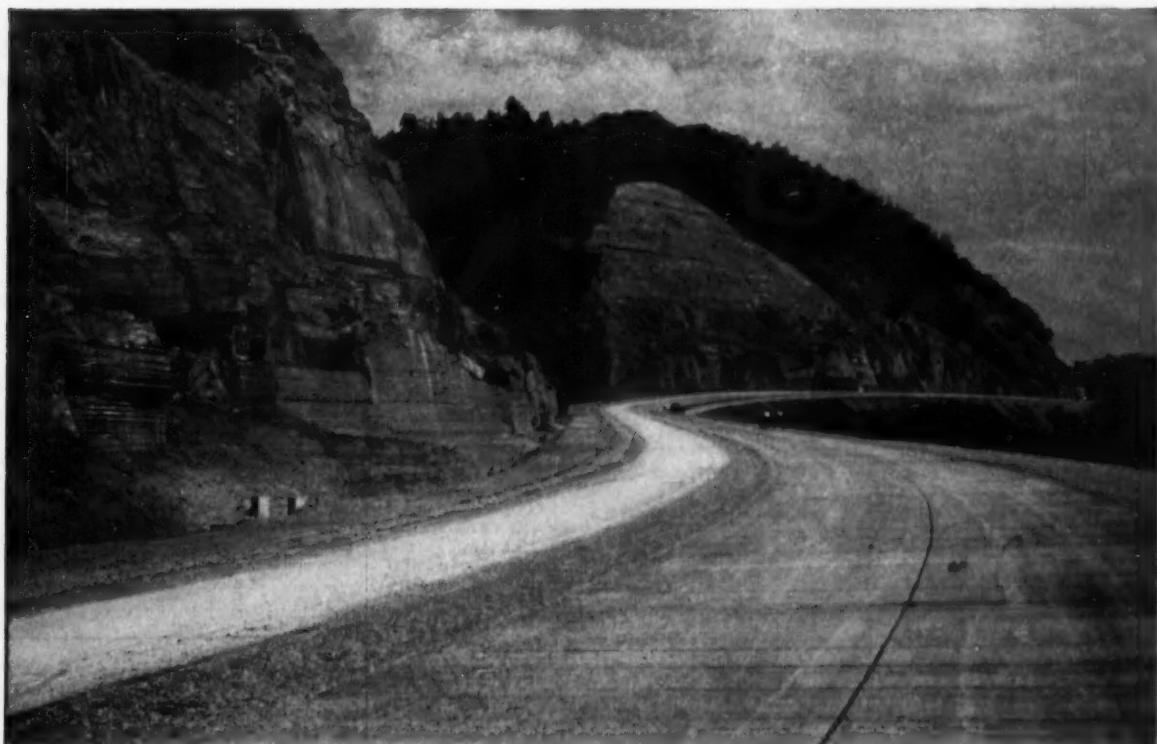
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Famous Last Words...

(By L. H. Scott, Turner Construction Co.)



"LOOKOUT FOR WHAT BUCKET!"



The 88-mile West Virginia Turnpike, built through terrain such as this, affords motorists some of the nation's most breathtaking scenery.

Removing 250,000 cu yd of Sandstone for West Virginia Turnpike

The motorist driving over the West Virginia Turnpike and struck by its scenic grandeur would never imagine what a herculean job of grading and rock removal made this new highway possible.

Extending 88 miles from Charleston, the state's capital, to Princeton, near the Virginia line, the Turnpike traverses part of the rugged Allegheny Plateau, plus a complex network of winding

streams, canyons and sharply pitched hills—hardly an ideal terrain for road building.

One of the contracts on this superhighway called for removal of some 250,000 cu yd of high-silica-content sandstone about 7 miles north of Princeton. The contractor, Clement Brothers Construction Co., Lenoir, N. C., used wagon drills equipped exclusively with Bethlehem 1½-in. round hollow drill steel,

fitted with carbide-insert bits. Blast holes ranged to 24 ft in depth. Reconditioning was done by Acme Machinery Company, Williamson, W. Va.

Bethlehem Hollow is generally found in the thick of things in the country's important construction projects. And you can always count on it for the same kind of steady, economical performance it contributed in helping to build the West Virginia Turnpike.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



Left to right: Mack Johnson, drill foreman, and Fred Clement, superintendent, both of Clement Brothers Construction Co., with John Persinger, Acme Machinery Co.



BETHLEHEM HOLLOW DRILL STEEL

TWO GRADES: CARBON • ULTRA-ALLOY (chrome moly)

Model 500 (jet) GAS SALAMANDER

by JACKSON
INSTANT HEAT...



Portable **Low Cost Heat**
Compact **No Fumes**
Efficient **Clean**
Instant Heat **Easy to Service**
Rugged Construction

RIGHT WHERE YOU WANT IT!

Contractors who need a dependable, portable source of instant heat rely on the new, 75,000 BTU, JACKSON Gas Salamander. Uses L/P (bottled), natural, or manufactured gases to produce an even heat which is deflected along floor (with no hot spot under heater) by a special, dual-purpose shield. Equipped with Underwriter Approved low-pressure regulator and 7 foot colored hose assembly with fittings. Automatic Safety Shut-Off Control stops flow of fuel when flame is extinguished. Inside baffle for hotter flame, more efficient use of fuel. Inexpensive to operate—simple to service. See the new Model 500 TODAY!



JACKSON MANUFACTURING COMPANY

HARRISBURG, PENNSYLVANIA

Oldest and largest wheelbarrow maker in America

STERLINGs are my FIRST choice because they LAST!



(Above) Model D3½S Maximum Capacity 3½ cu. ft., 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

(Right) Model C5W Maximum Capacity 5 cu. ft., 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty maleable wheel guard.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Sterling
WHEELBARROWS



Look for this Mark of
STERLING Quality

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THE UNBEATABLE COMBINATION FOR

Profit!

SUPER-HIGH
OUTPUT
HERE

SUPER-LOW
MAINTENANCE
HERE



Cedarapids

Built by
IOWA

IT'S YOURS IN THE

SUPER TANDEM

ASK Super Tandem owners about Super Tandem performance! One contractor produced 3/4" minus material at a rate of 228 to 310 tons per hour with average percent of crush 20%. On this job, maintenance costs on the Super Tandem were less than three-fourths of a cent per yard! Figure out what this kind of low-cost production will mean on your jobs!

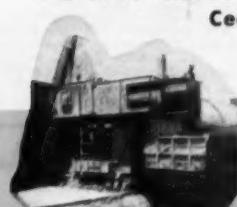
The Cedarapids Super Tandem is newly engineered for the extra high screening capacity that gives you a big advantage in any pit and is especially profitable where there is a high percent of fines or contaminated material.

Look over the features listed at the right, then ask your Cedarapids distributor to show you how you can apply them to your work for higher profits.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

CHECK THESE FEATURES

- ✓ Big 48" x 12' 2 1/2 Deck Horizontal Vibrating Screen assures really high screening capacity, particularly desirable where gradation of a big volume of material is necessary.
- ✓ 2416 Roll Crusher and 1036 Jaw Crusher deliver a steady flow of crushed material.
- ✓ Flexibility with optional Swivel Feed Conveyor, Spray Bar attachments and Sand Ejector Screw to meet every job condition.
- ✓ Delivery conveyors, plant conveyor and under-crusher conveyor are 30" wide to handle the increased screening capacity of the plant.
- ✓ Quality construction of every unit cuts maintenance costs to the minimum, keeps plants operating all day every day to maintain your high production averages.



Master Bituminous
Mixing Plant



Portable Primary
Jaw Crusher



Double Impeller
Impact Breaker



Model G-60 6000-lb.
Bituminous Mixing Plant

"Superior" Electric

Carpullers



CAPSTAN TYPE,
DRUM
TYPE
AND SPECIAL
TYPES

Model SC Superior
Capstan Carpuller

Model EP Drum
Type Carpuller

One man can move hundreds of tons of rolling load with practically no effort. Economical, efficient, Carpullers are available for your specialized requirements.

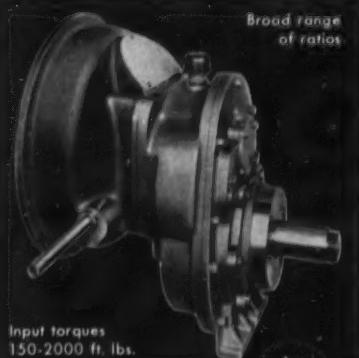
Write for bulletins and catalogs!

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SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

Main Office and Works: SUPERIOR, WISCONSIN, U. S. A.
New York Office, 7 Bay Street, New York 7, N. Y.

Broad Range
of ratios



Input torques
150-2000 ft. lbs.

Special heavy-duty

- Transmissions
- Reduction Units
- Mechanical Drives for Torque Converters

Cotta Transmission Co., Rockford, Illinois

COTTA
HEAVY-DUTY
TRANSMISSIONS

"Engineered-to-order"

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Fast, easy way to
CUT WIRE ROPE
Low cost, portable, safe
For details mail ad to
MONTGOMERY MFG. CO.
24Y Austin St., Newark 5, N.J.
Dealers wanted



SEARCHLIGHT SECTION

(Classified Advertising)

SEARCHLIGHT SECTION

(Classified Advertising)

H. E. Hiltz, Mgr.

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CONSTRUCTION METHODS AND EQUIPMENT

330 West 42nd St., New York 36 — LO 4-8000

E. E. WEYENETH, Advertising Sales Manager

HOWARD T. OLSEN, Business Manager



Member of Associated Business Publications and Audit Bureau of Circulations

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The advertising rate is \$15.75 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured $\frac{1}{6}$ " vertically on one column, 3 columns—30 inches to a page.

Send NEW ADVERTISEMENTS to N. Y. office, 330 W. 42nd St., N. Y. 36, N. Y., for January Issue closing January 20th.

MANUFACTURER'S REPRESENTATIVES FOR MASONRY SAW BLADES

Sales representation needed in the following organization in all principal areas. Only men with strong following and experience in the field of masonry cutting need apply. Must be capable of earning \$7500. per year to start. We are presently manufacturing for one of the leading national distributor. Send complete resume. All replies strictly confidential.

THE EDMAR COMPANY,
P. O. Box 28, Andalusia, Pa.

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HAVE EXCELLENT territory open for experienced crane and shovel salesmen—must have at least 5 years successful selling record with excavators. Complete quality line, large ownership in the area. Write giving references, details of experience, etc. to box SW-4800, Construction Methods.

EQUIPMENT-USED-SURPLUS

For Sale

For Sale: Sno-go Model LTR with truck loading mechanism mounted on Marman Herrington Ford V-8 four wheel drive. Used only a few hours, like new, reasonable. Luke Garrecht, Washington Ave., Tappan, New York.

For Sale: 150 KW generator, 220-440, powered by twin 671 G.M.C. Fully automatic, 800 hours. Excellent shape. 271 G.M.C. Diesel outboard bearing, extended shaft, steel base, complete with clutch and radiator, 100 hours since reconditioned. Hyampom Lumber Company, Hyampom, California.

ENGINEERS—FOREMEN—OFFICE MEN

Learn latest methods to organize and run work. Prepare for the top jobs.

Send post card for details.

GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 5th Ave., Lake Worth, Florida

Power with INTERNATIONAL to Cut Production Costs



SURE THING FOR SHOVELS. The INTERNATIONAL 203 horsepower UD-1091 diesel engine that powers this Koehring No. 205 shovel is one of 18 IH engines that keep production high, maintenance low on everything from the big dippers to rock crushers, from motor graders to generators.

Specify an INTERNATIONAL engine — first choice of more than 200 leading equipment manufacturers

INTERNATIONALS are first choice of more than 200 leading equipment manufacturers because:

1. They power machines at peak efficiency for years and for minimum maintenance and operating cost—features of IH heavy-duty engines for more than 50 years.
 2. They have unsurpassed parts and industrial application service support in the field—from INTERNATIONAL Industrial Power Distributors backed up by IH Parts Depots and IH field service engineering—features that mean maximum production for the long life of the engine.
- So it will pay you to specify IH engines as

original equipment and replace with IH, when it's time to repower. Get the full facts on how you can cut operating costs on your equipment by putting in an INTERNATIONAL. There are 18 diesel and carbureted engines in the IH line that ranges from 16.5 to 214 horsepower at useable speed—each a pay-off power plant in its own class.

INTERNATIONAL HARVESTER COMPANY,
CHICAGO 1, ILLINOIS



**INTERNATIONAL.
INDUSTRIAL POWER**

MAKES EVERY LOAD A PAYLOAD

Methods Memo . . .

HEALTHY COMPETITION is back in the saddle, as evidenced not only by many more contractors bidding on most jobs but also by manufacturers putting more aggressive selling behind new and improved construction equipment. For instance, the American Tractor Corp., Churubusco, Ind., maker of small crawlers and a host of handy attachments for them, is exhibiting 12 new models throughout the country.

The firm is presenting a "Tractorama" in 22 cities, patterned after the General Motors Motorama new car shows. Explained at these shows are long-term lease programs, with or without option to buy, a plan whereby a contractor can purchase a Terratrac with as little as \$400 down, with seasonally reduced payments, if desired. There also is a new dealer floor plan program that will enable him to demonstrate to prospects with the manufacturer's backing. Marc B. Rojtman, president, makes it quite clear that he is out to get a large share of the small track-type tractor business. And we have heard that he is packing them in wherever the Tractorama appears.

Note also a better new scraper being introduced by LeTourneau-Westing-

house—and the strong statement on new company policy backing its equipment in an article beginning on page 92. Then too, on pages 33-48, note the ultra-complete description of its new Model 105 track-type tractor by the Eimco Corp., complete with numerous interesting comparisons—in a bold, brilliant bid for a sizable slice of the market.

All these and many more are putting their full resources behind their competitive efforts. The new year is off to a fast-paced start!

FLASH!—Just before going to press, CM&E learned that LeTourneau-Westinghouse has entered into an agreement to purchase the plant and assets of the J. D. Adams Manufacturing Co., Indianapolis. Adams, a builder of road machinery since 1885, is well-known for its motor graders and makes a travel loader called the Elegrader. The purchase includes all inventories and two manufacturing plants. The new acquisition will be the Adams Division.

Huber Manufacturing Co., Marion, Ohio, and the W. A. Riddell Corp. of Bucyrus, have teamed up as the Huber-Warco Company. The products trade name will be "Warco."

GEORGE A. FULLER CO., contractors who are putting up the 41-story Prudential Building in Chicago, have an enviable record. Not only is the structure they're presently working on (story, p 66) the first skyscraper office building built in the Windy City in 20 years, but Fuller also built the last previous one—the 45-story Marshall Field Building, completed in 1935. And while it may have been a long time between tall buildings in Chicago, it wasn't between jobs for Fuller: That construction outfit has handled some \$1½-billion worth of contracts in the interim.

JUNGLES and tropical weather are not the only troubles of Malayan contractors. They also have to do battle with Communist bandits who stalk construction workers from the dark edges of jungle foliage. On one project, the Maran Road, running 200 mi through Central Malaya from Singapore to Kuala Lumpur, a fleet of Allis-Chalmers HD-20 tractors is bullet-scarred from encounters with snipers. The situation is so bad that armed sentries stand watch to prevent sudden intense assault. The project is proceeding on schedule, in spite of this extra obstacle.

New York Builders Protest Overtime Grant

THE BUILDING INDUSTRY EMPLOYERS of New York State, at their 59th annual convention in Buffalo last month, adopted a strong resolution protesting the disregard by the New York State Thruway Authority of the state's Eight Hour per day Forty Hour per week labor law. Construction of all permanent gas stations, restaurants, and service areas were deemed by Thruway officials emergencies sufficient to warrant dispensation by the State Department of Labor, but the matter was brought to a head by the specifications for the northerly approach to the high-level bridge at Buffalo.

CM&E's labor editor, Leon Kromer, learned that specifications for this estimated \$7,500,000 project inform prospective bidders that the Department of Labor will grant dispensation and authorize employment of labor up to six 10-hr days a week. The specifications also contain a form for the successful bidder to use in applying for dispensation, even to the extent of setting forth the reasons—"Necessary to relieve congestion in adjacent routes. Labor shortage in area."

In its resolution, the BIE noted "It is earnestly believed that overtime dispensation is a continuation of a practice which has made the work unnecessarily and unduly expensive, has served to disrupt labor conditions in the area, siphoning labor from other projects, adding to their cost and the time for their completion—projects and housing no less important to the people in the area of the work and to the general economy."

Denying that there was an emergency, as expressed in the State Constitution sufficient to grant dispensation, the builders' association, seriously concerned over the impact of a

60-hr week on the local labor market (laborers can earn \$185 per week and skilled mechanics as much as \$255), has requested that the contract specifications on the bridge project be changed, and the practice discontinued.

According to Article 1, Section 17, of the New York State Constitution, workmen on public works projects cannot be employed more than 8 hr daily, and 5-day weeks must be maintained. Also, employees must be paid the wage rates prevailing in the area for the same trade or activity. This labor specification is implemented in Section 220 of the State Labor Law.

Exceptions (called dispensations) are allowed during periods of "extraordinary emergency"—including fire, flood and danger to life and property. A dispensation must be obtained from the State's industrial commissioner. He can grant one also for preservation of contract site.

Checking across the country, Editor Kromer notes that, besides New York, 24 states and the District of Columbia have laws of one sort or another limiting hours of work of laborers and mechanics employed on public works of the state or any political subdivisions thereof. A few have 40-hr work weeks, several 48-hr weeks. A number specify the combination of 8 hr daily and 40 per week; a few specify 8 and 48; and one state permits an 8-hr day and a 56-hr week!

Important short-season operations, like highway paving, have gone along at high speed with common consent. But the influential BIE has taken a definite stand against a dispensation for the Buffalo bridge approach, where the group evidently sees no "extraordinary emergency."

largest
of its kind....



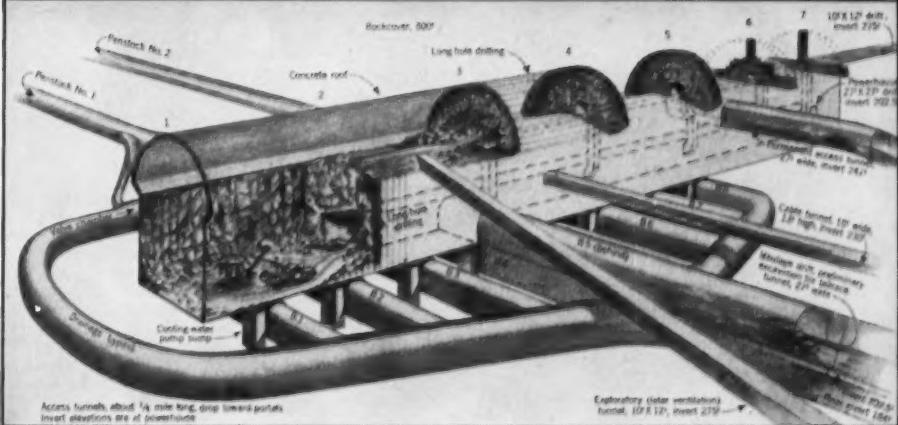
**another noteworthy
ALCAN power project
where POZZOLITH®
was employed
in concrete**

Alcan's 13-year experience with Pozzolith—Shipshaw Dam in 1941, Arvida Plant, Peribonka Power Developments No. 1 and No. 2 and others—led to its use in building the great Kemano-Kitimat power project, a portion of which is shown here.

Alcan engineers employ Pozzolith to assist them in meeting their high standards of strength control, and requirements of flow and workability without excessive bleeding or segregation.

ALCAN-KEMANO-KITIMAT POWER DEVELOPMENT

Owner: Aluminum Company of Canada, Ltd. Engineer: British Columbia International Engineering Co. Ltd., Vancouver, B.C. General Contractor: Morrison-Knudsen Co. Ltd., Boise, Idaho.



Whatever the materials or conditions, Pozzolith with its adaptations facilitates the production of concrete of specified qualities, and at a lower cost than by any other means.

***POZZOLITH** . . . reduces unit water content up to 15% for a given placeability, and fully complies with the water-cement ratio law. Adaptations of Pozzolith permit rigid control of entrained air. Produced in three standard formulations—High Early Pozzolith, Normal Pozzolith and Low Heat Pozzolith—to give the results required under varying job conditions.

The MASTER



BUILDERS

८

Subsidiary of American-Marietta Company

Spreads 400 tons of road base per hour ... with help of 100 TIMKEN® bearings

THE Blaw-Knox Model P-150 Base Paver shown below can spread road base material of all kinds, ranging in size from dust to 5 inches, at a rate that averages up to 6½ tons a minute.

The 100 Timken® bearings used on the P-150 are one of the main reasons this 12-ton machine operates smoothly and without breakdowns. Timken bearings practically eliminate friction. For two reasons: a tapered design that is geometrically correct to produce true rolling motion, the answer to friction; and manufacture that lives up to the design. We even make our own steel.

It's the only way we can be sure it's good enough for Timken bearings. We're the only U. S. bearing maker that does.

One Timken bearing application in this machine illustrates several of the reasons Blaw-Knox uses so many. Timken bearings on the eccentric that oscillates the screed take severe radial and thrust loads. Because of their tapered design, Timken bearings can take any combination of radial and thrust loads. And they take heavy, rapid shock loads—because rollers and races are case-hardened to provide a hard, wear-resistant surface over a tough,

shock-resistant core. Timken bearings require little lubrication, minimum maintenance, because they keep shafts and housings concentric, make closures more effective. Lubricant stays in and dirt out.

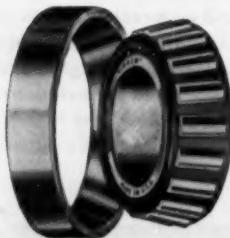
All these advantages and more are yours when you specify the bearings with the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



BLAW-KNOX uses 100 Timken bearings on the P-150 Base Paver to get long life, low friction, little maintenance.



TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



SMOOTH TO MILLIONTHS OF AN INCH

Surface finish of high quality Timken bearing rollers and races is so smooth that it takes a profilograph to measure its smoothness. This instrument measures surface variations to a millionth of an inch, as shown at the left.

NOT JUST A BALL • NOT JUST A ROLLER • THE TIMKEN TAPERED ROLLER • BEARING TAKES RADIAL AND THRUST → LOADS OR ANY COMBINATION

